

Figure 1

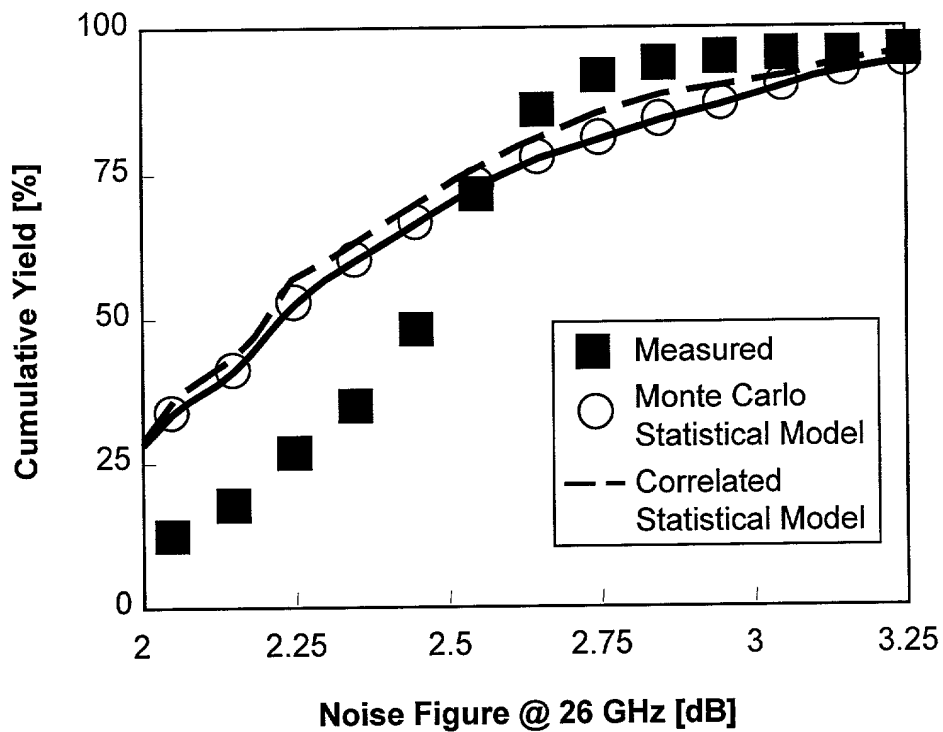


Figure 2A

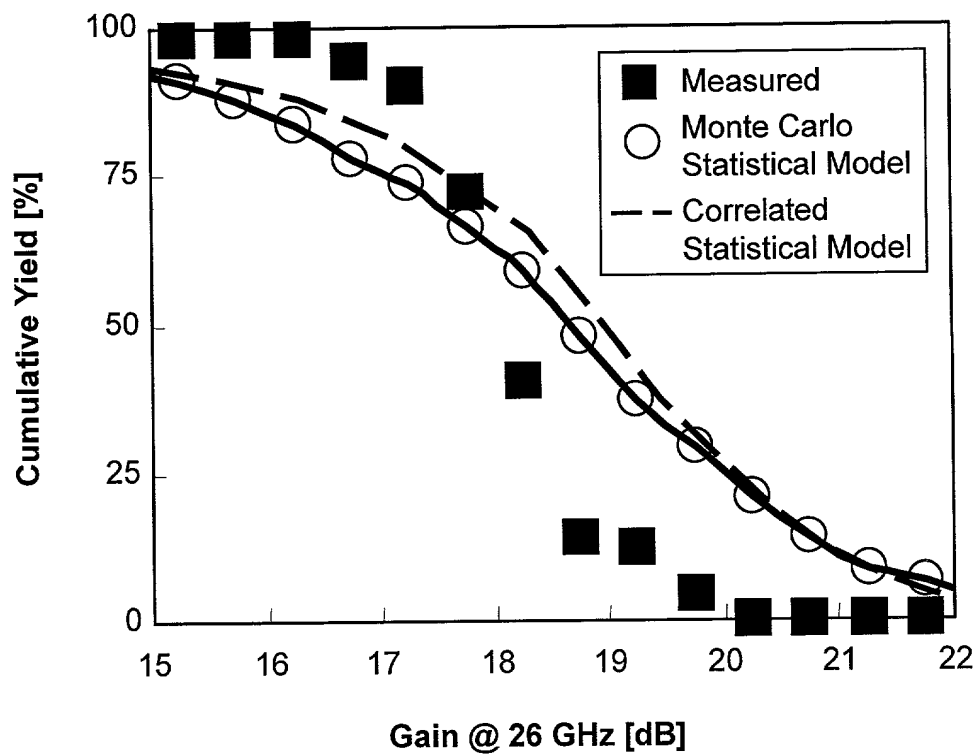


Figure 2B

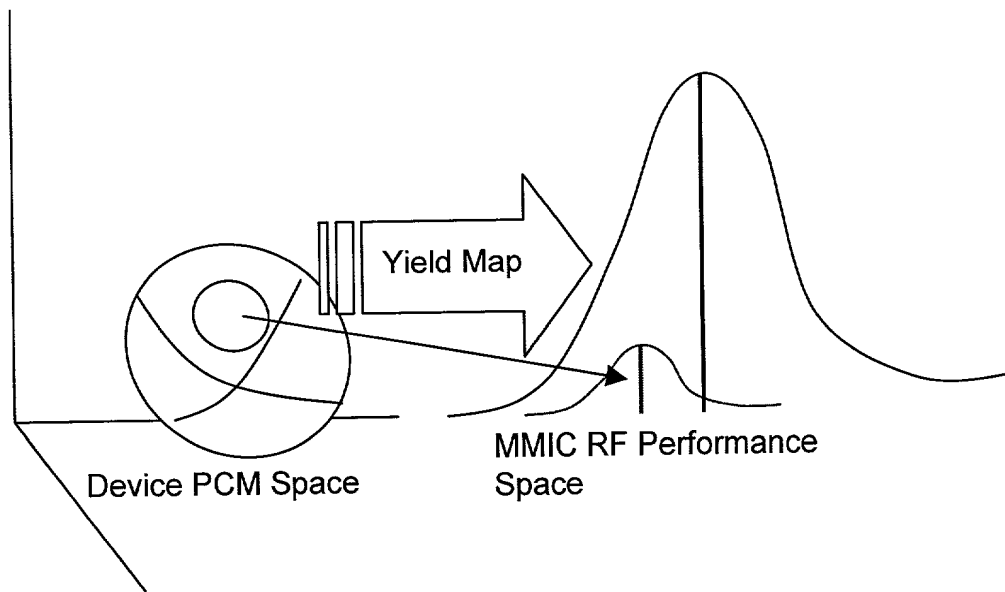


Figure 3

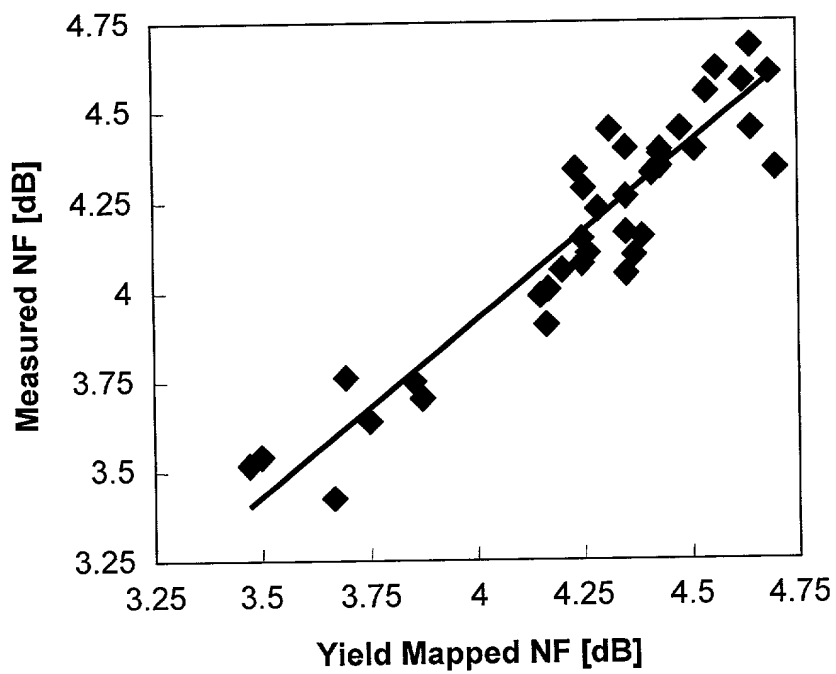


Figure 4

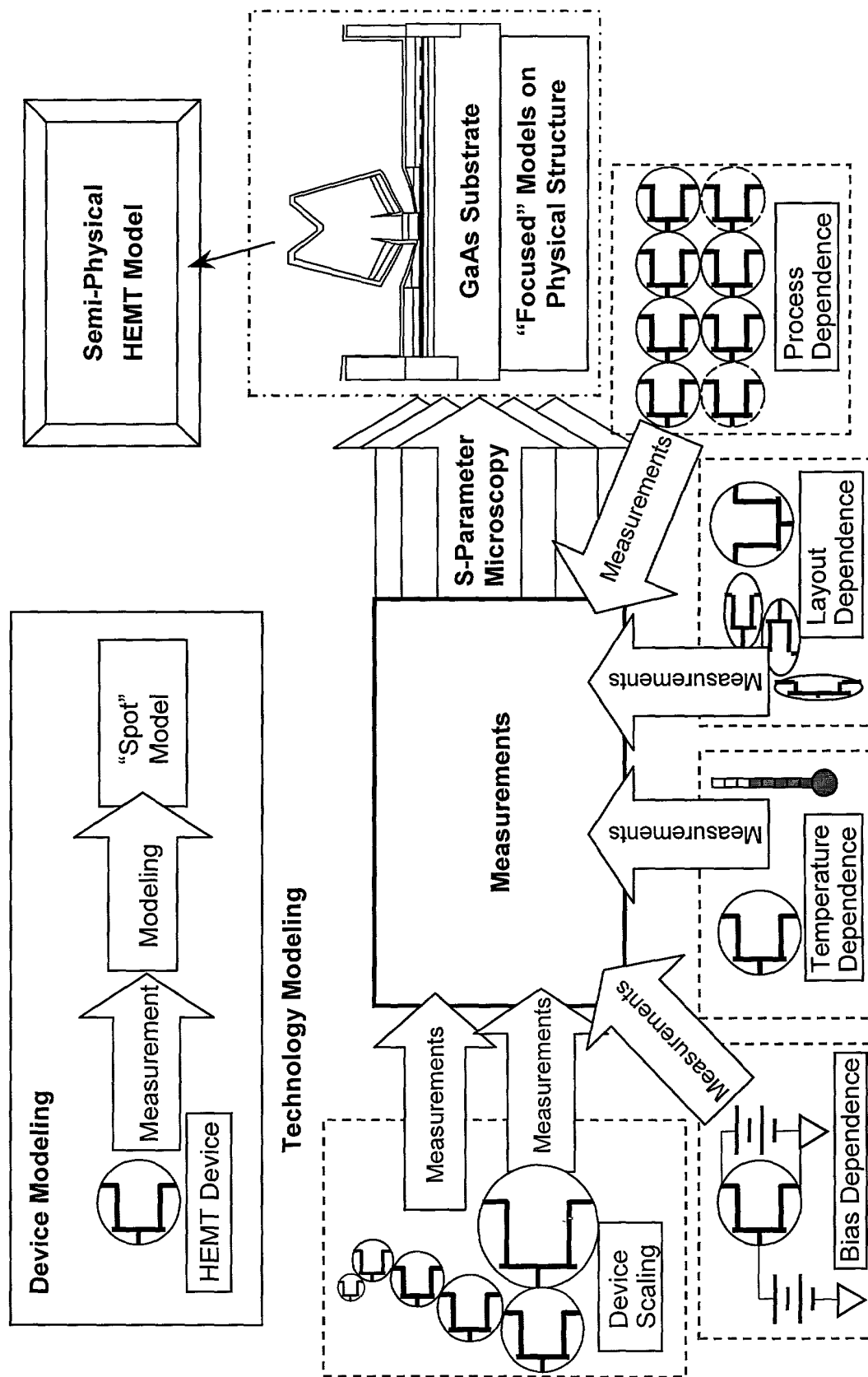


Figure 5

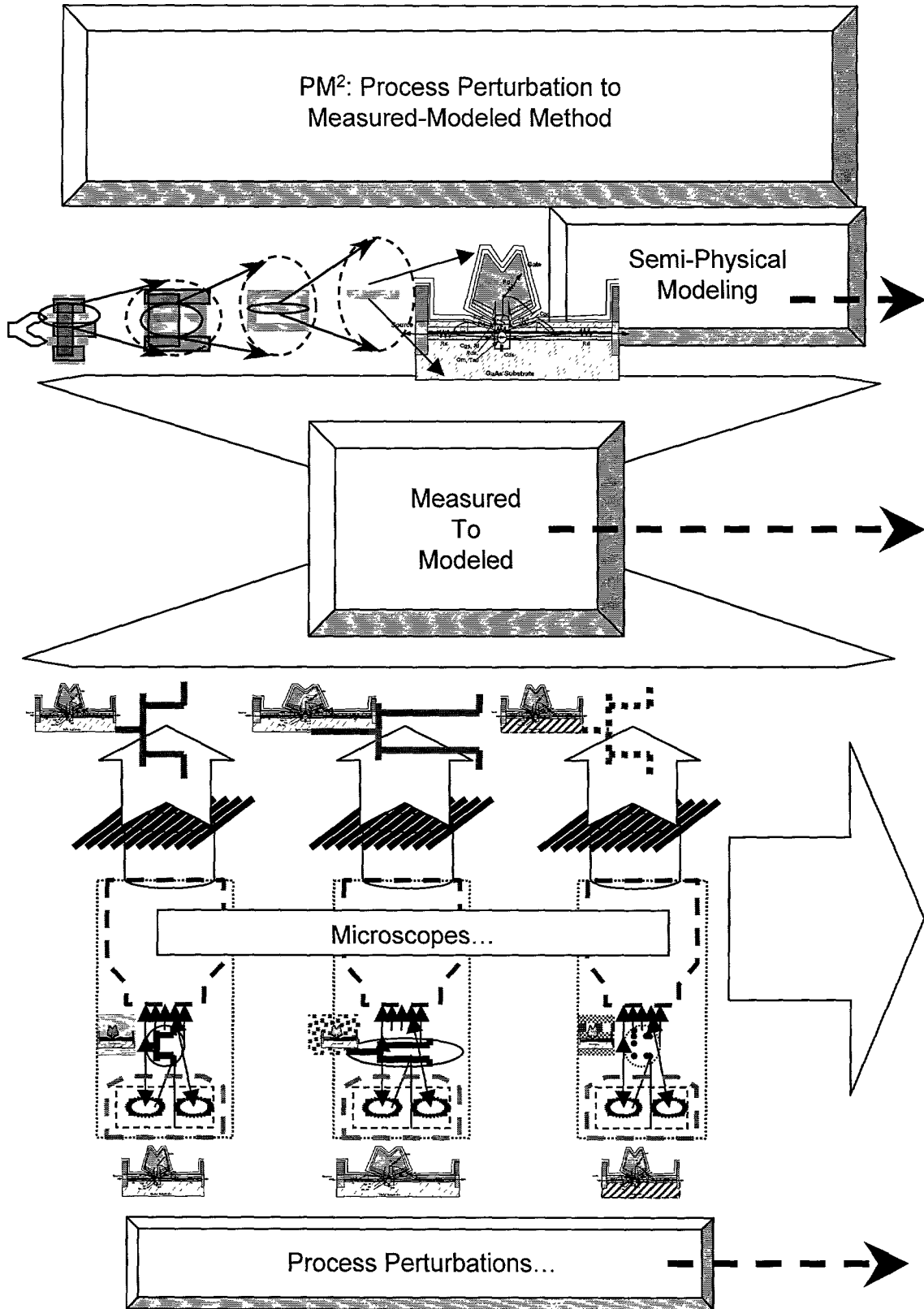


Figure 6

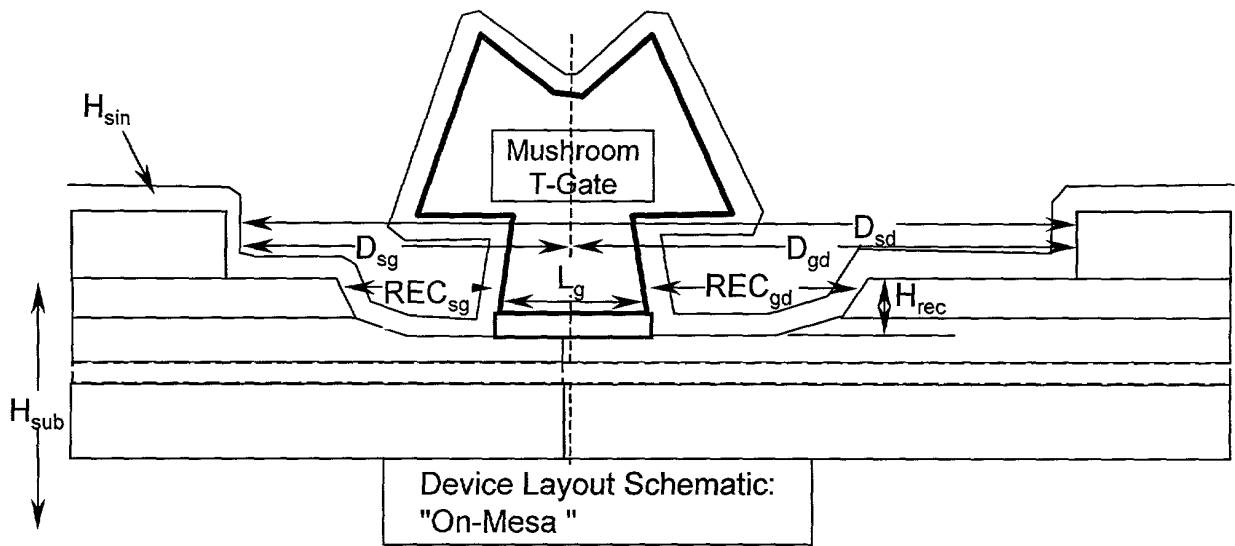


Figure 7A

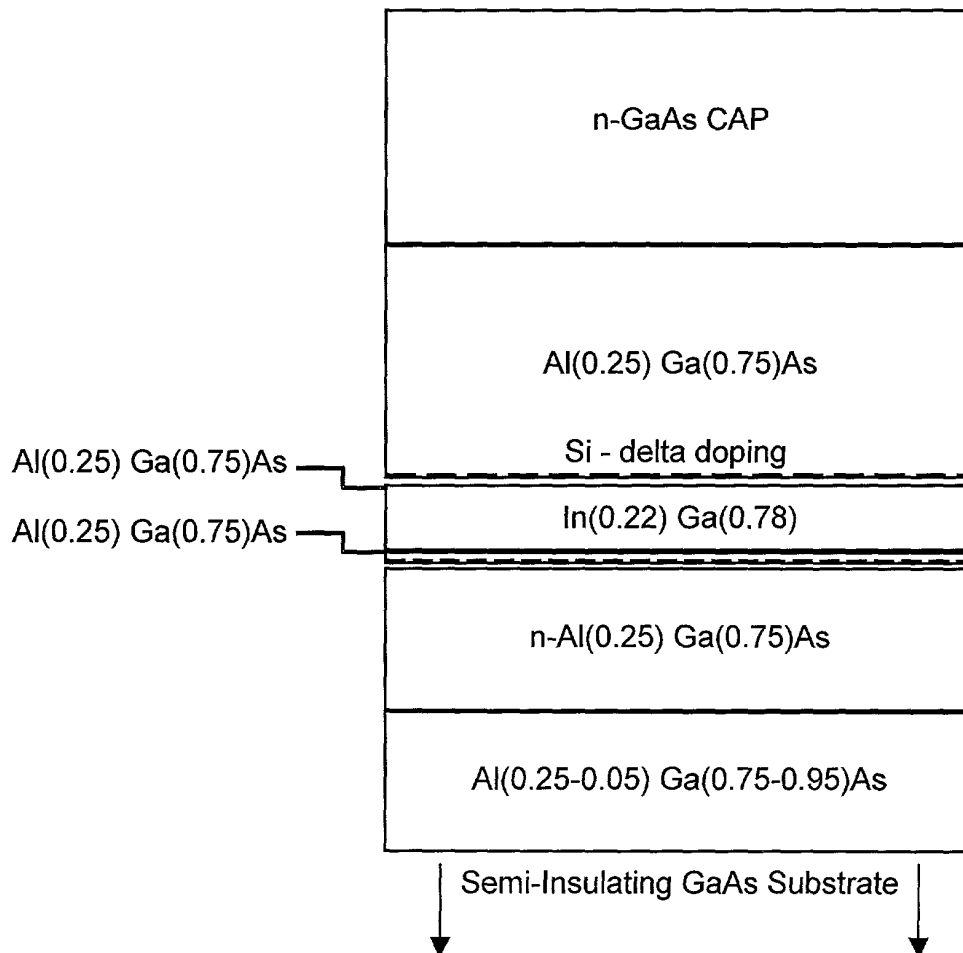


Figure 7B

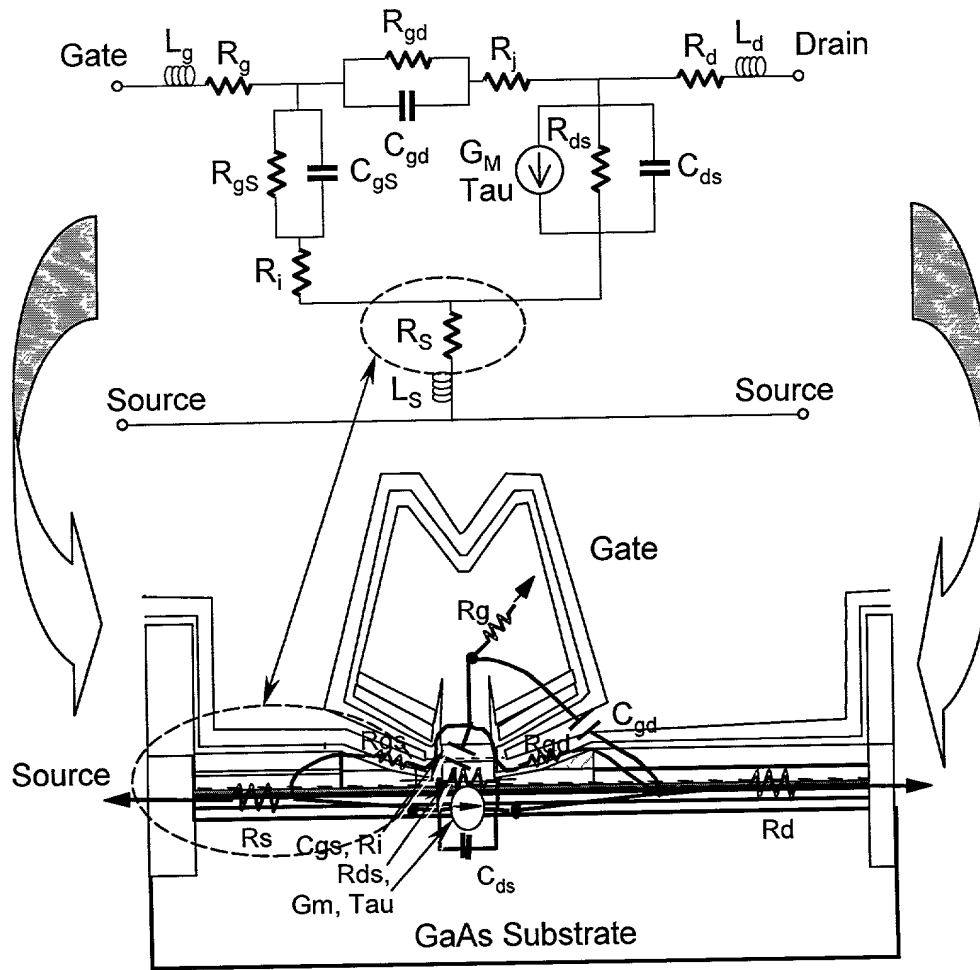


Figure 8

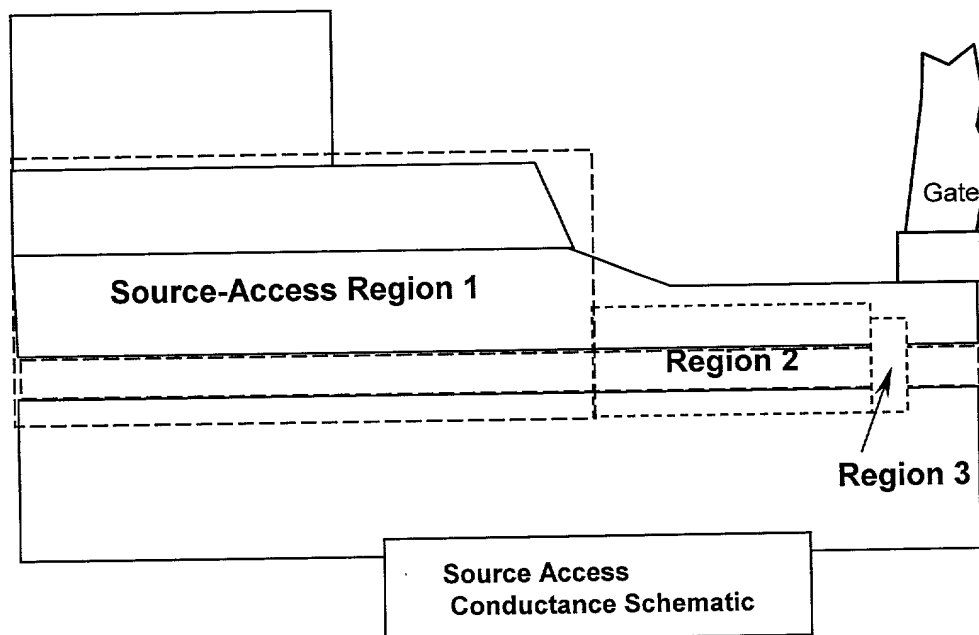


Figure 9

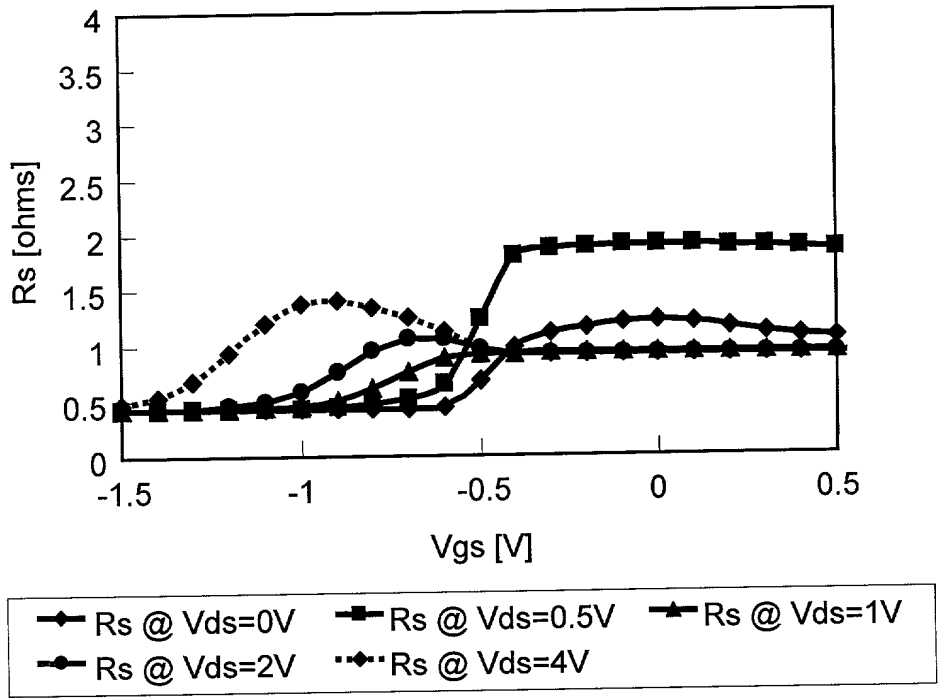


Figure 10A

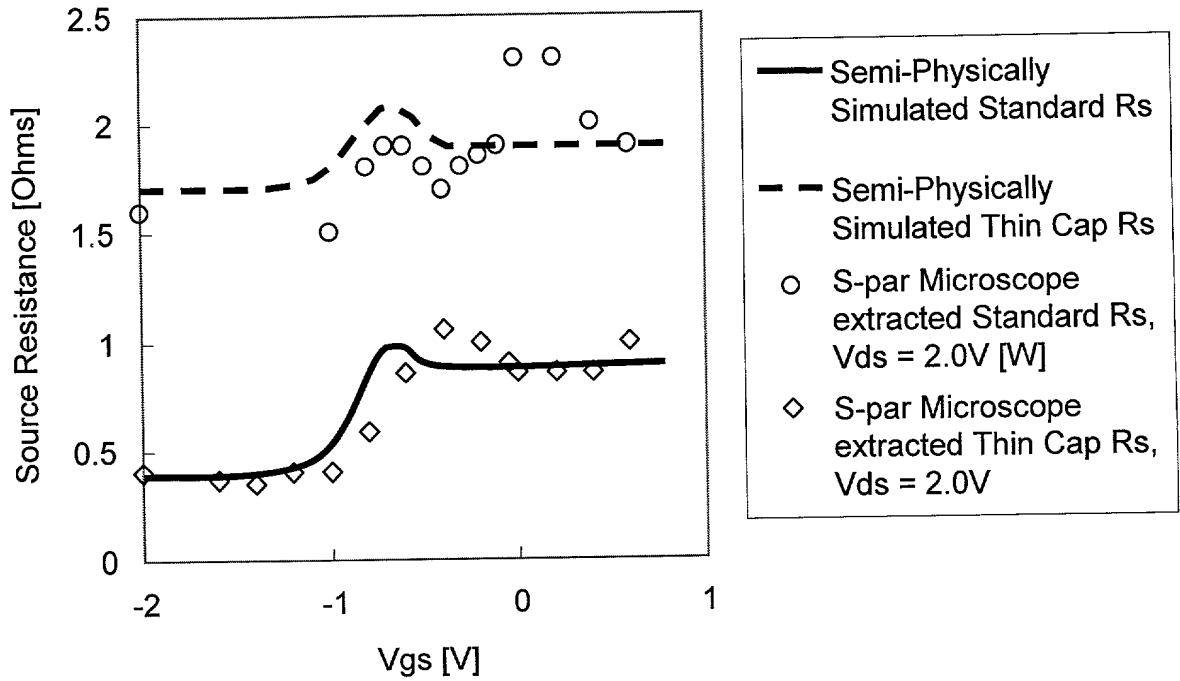


Figure 10B

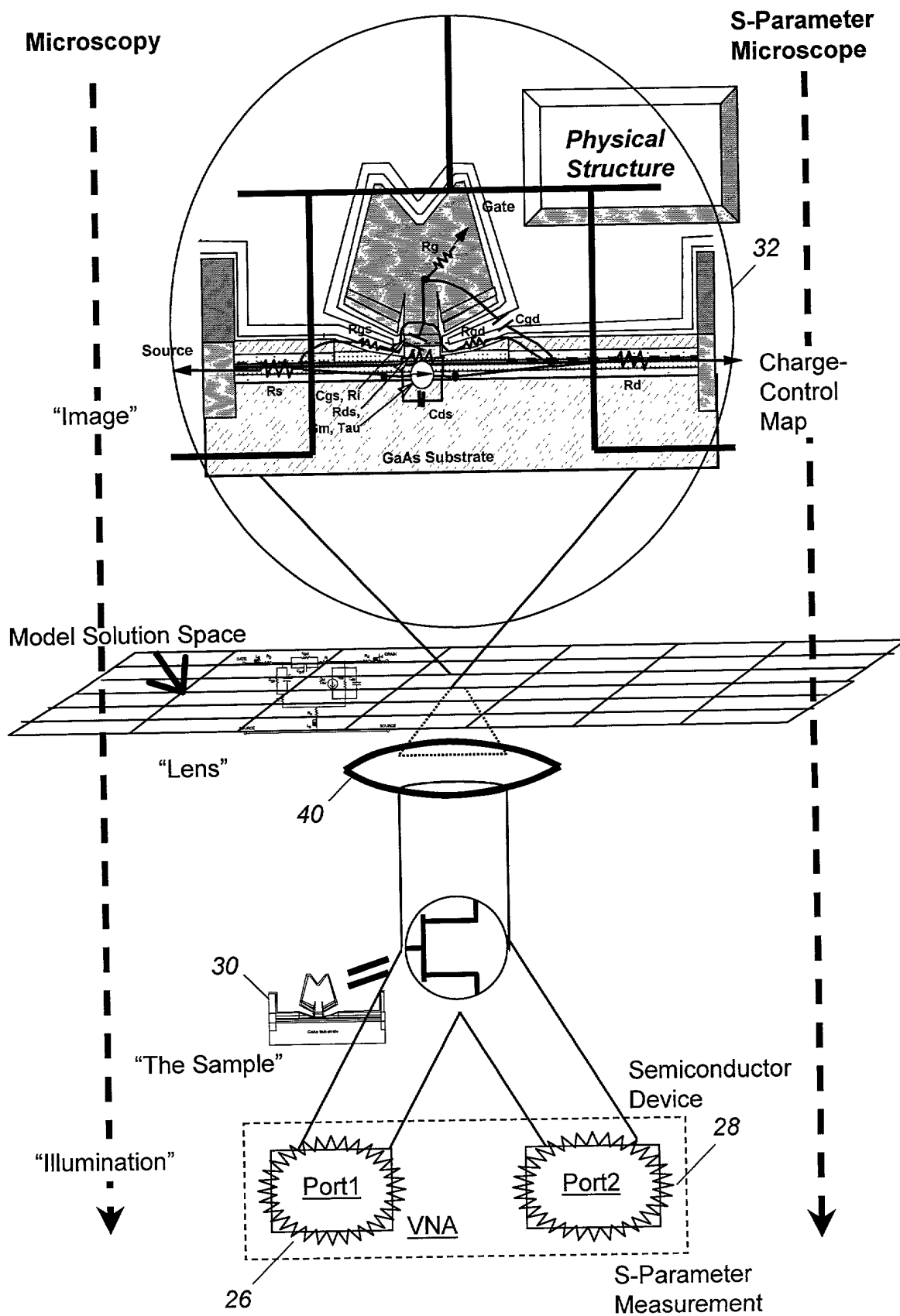


Figure 11

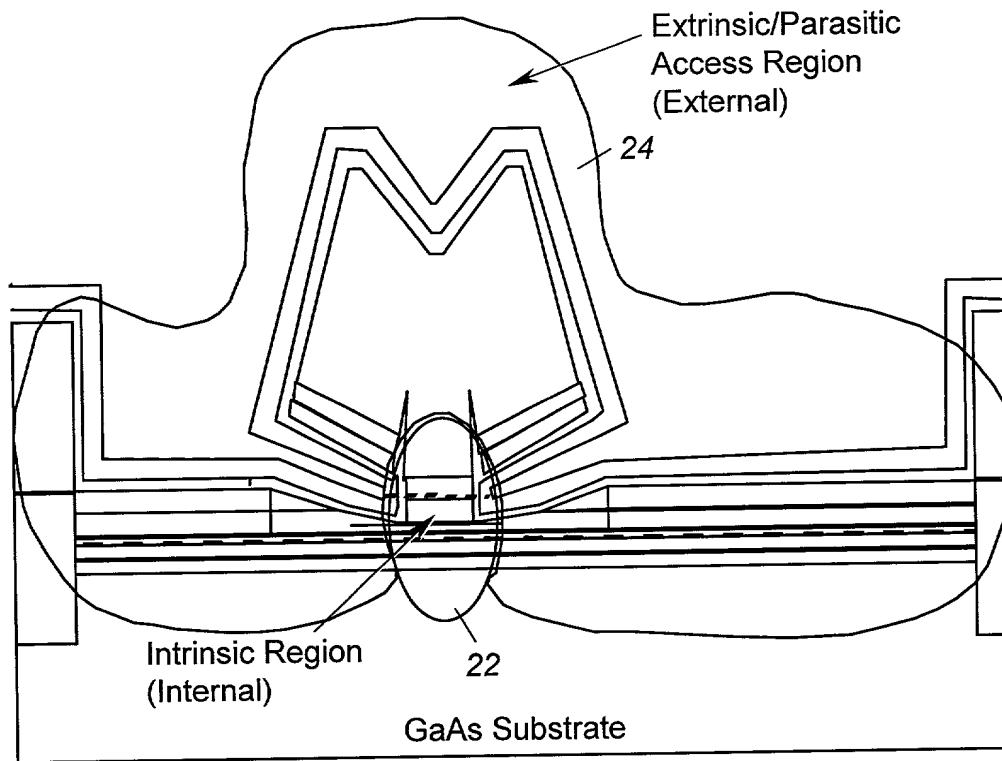


Figure 12

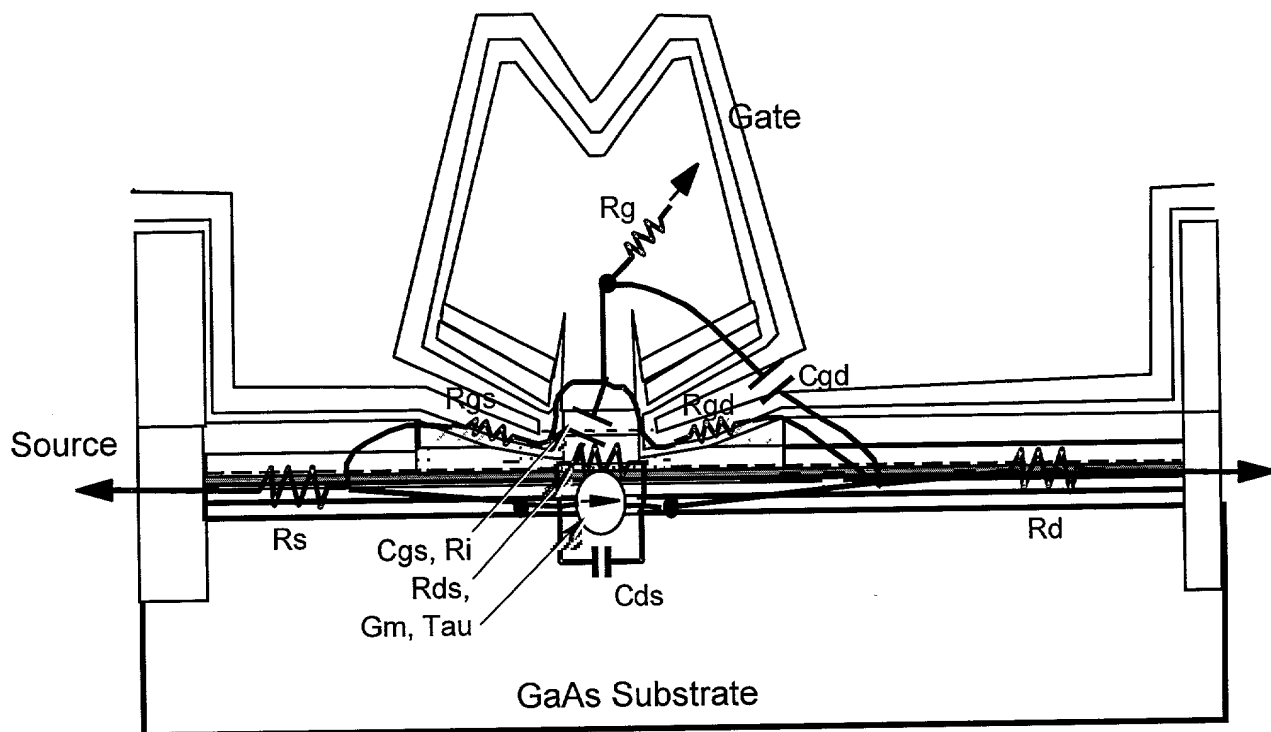


Figure 13

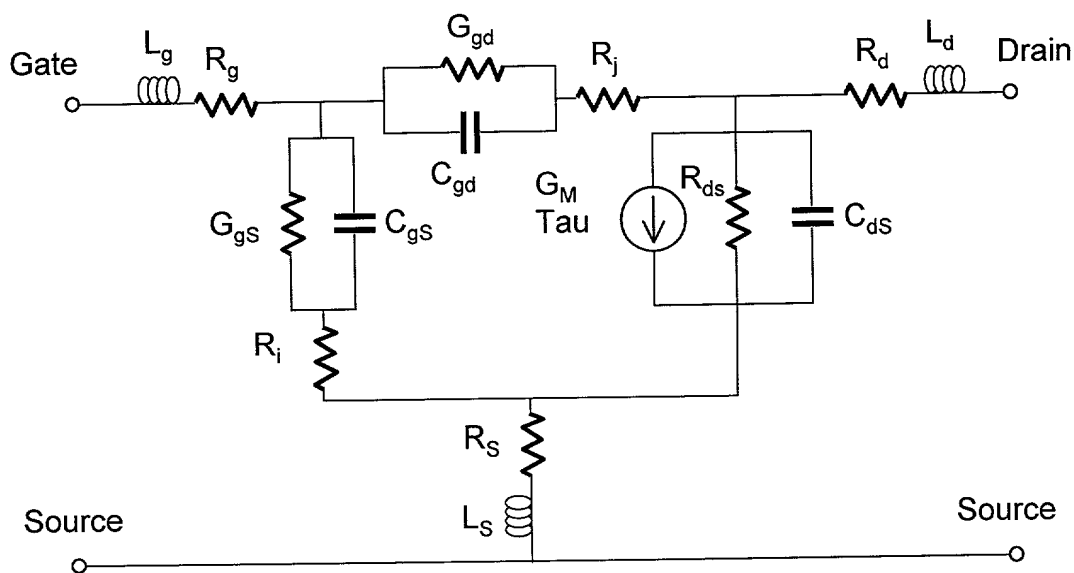


Figure 14

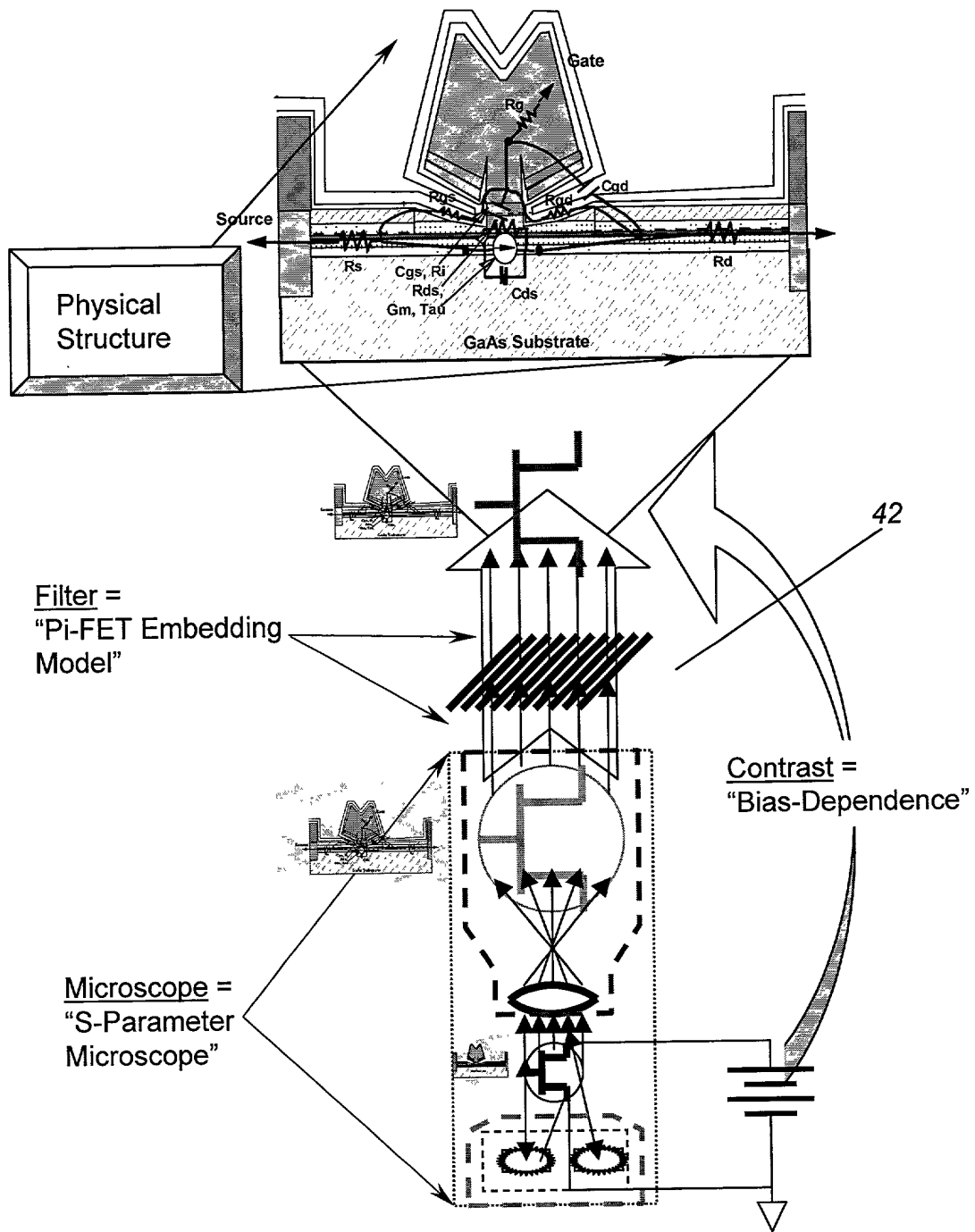


Figure 15

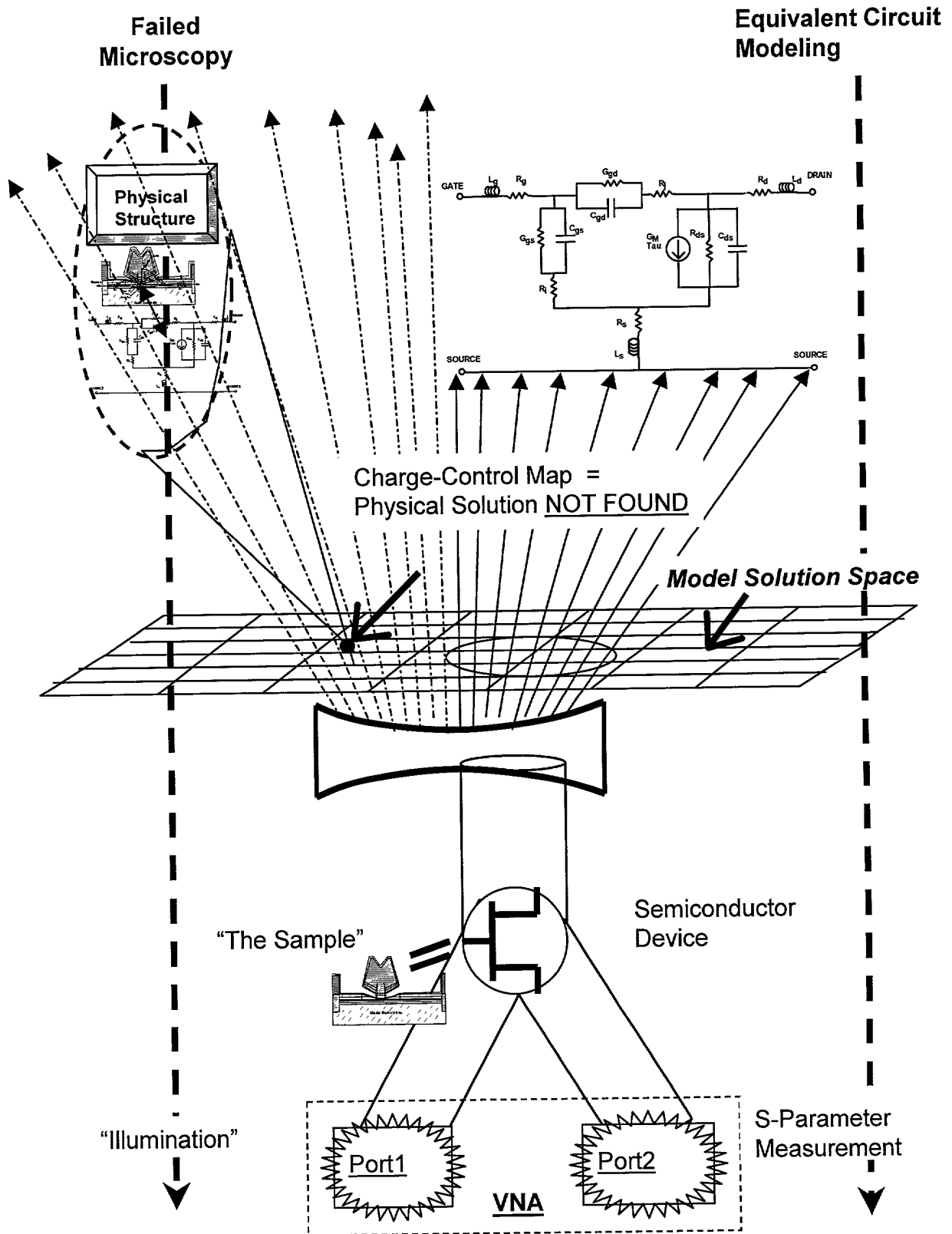


Figure 16

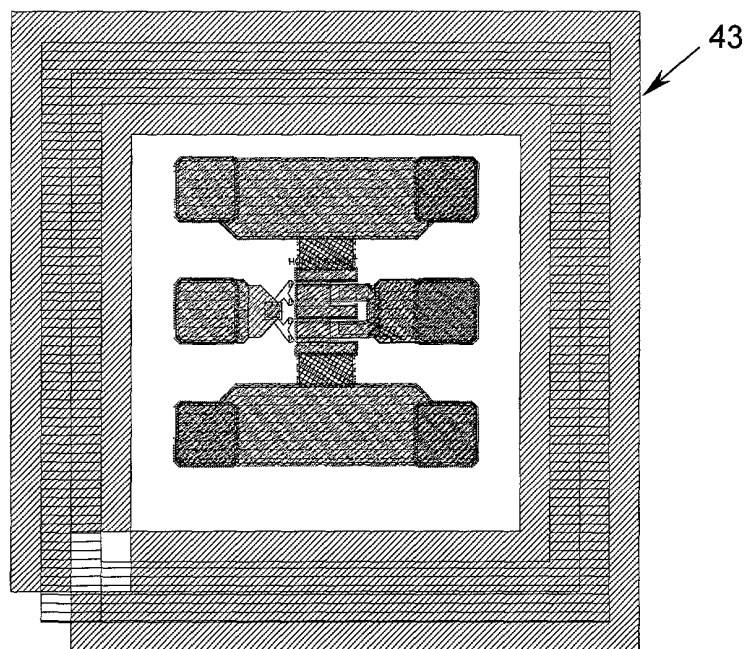


Figure 17

Ids vs Vds for the Measured HEMT Device

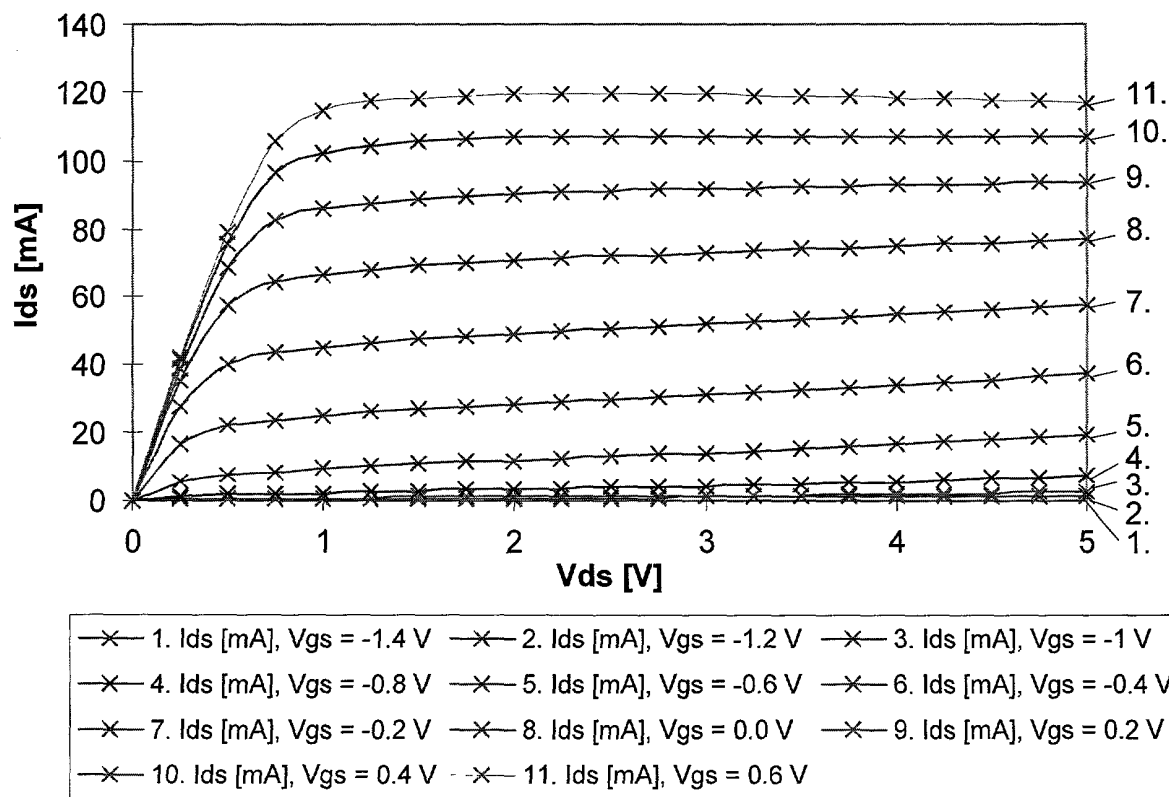


Figure 18

Ids and Gm vs Vgs for the Measured Device

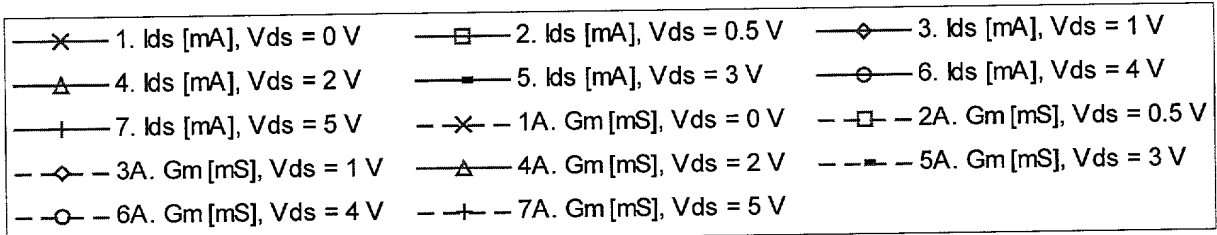
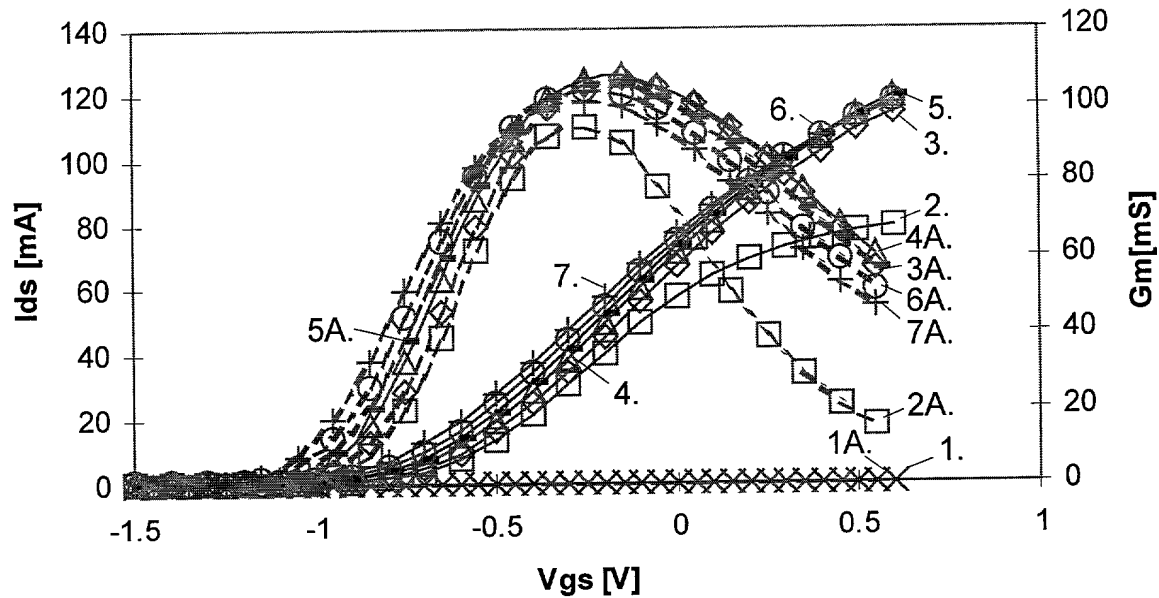


Figure 19

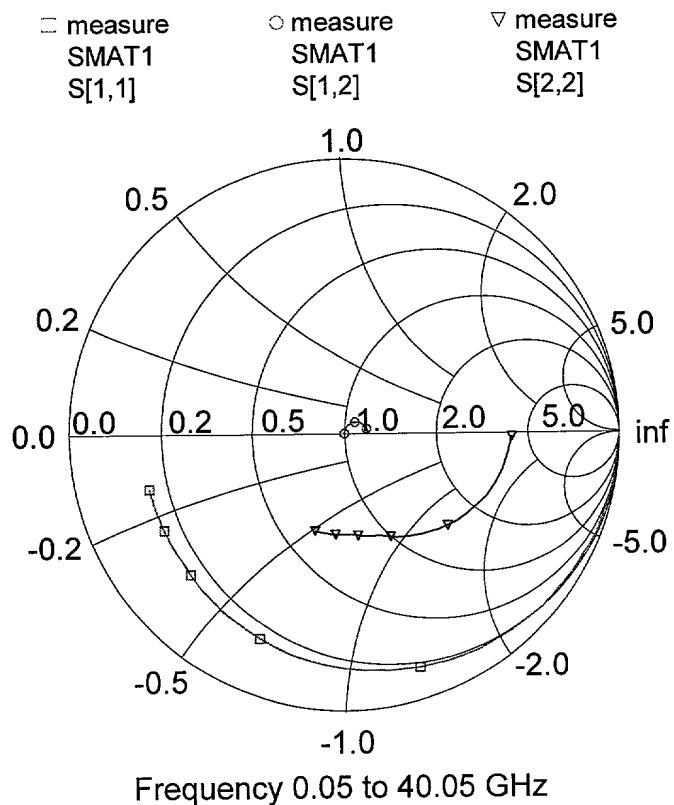


Figure 20

00504860

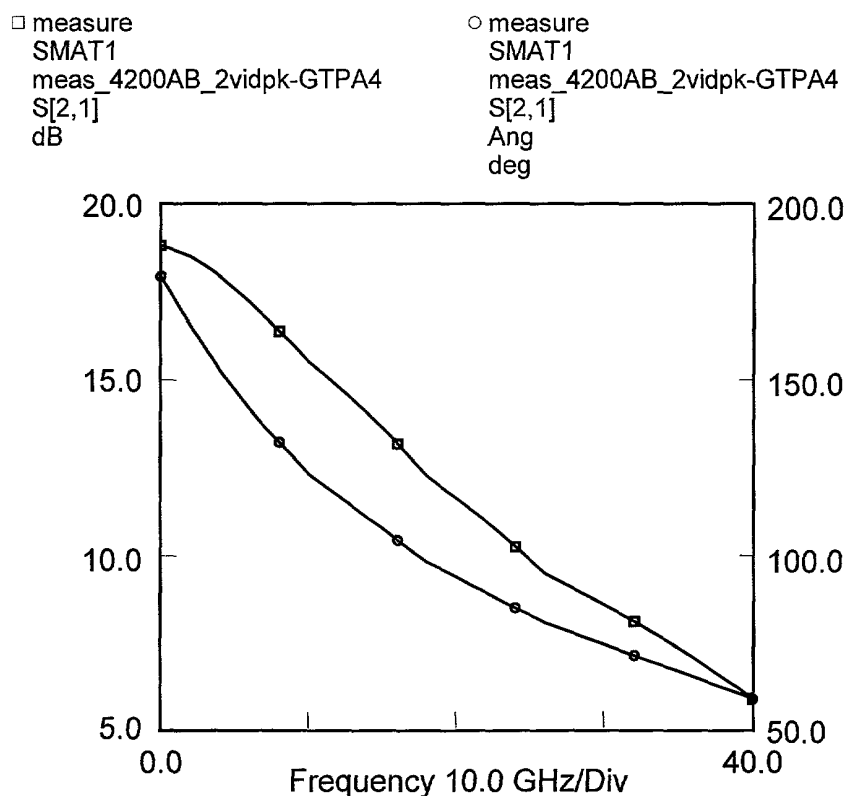


Figure 21

Intrinsic Device Source Resistance vs Gate Bias 0.15 μm P3H4 HEMT

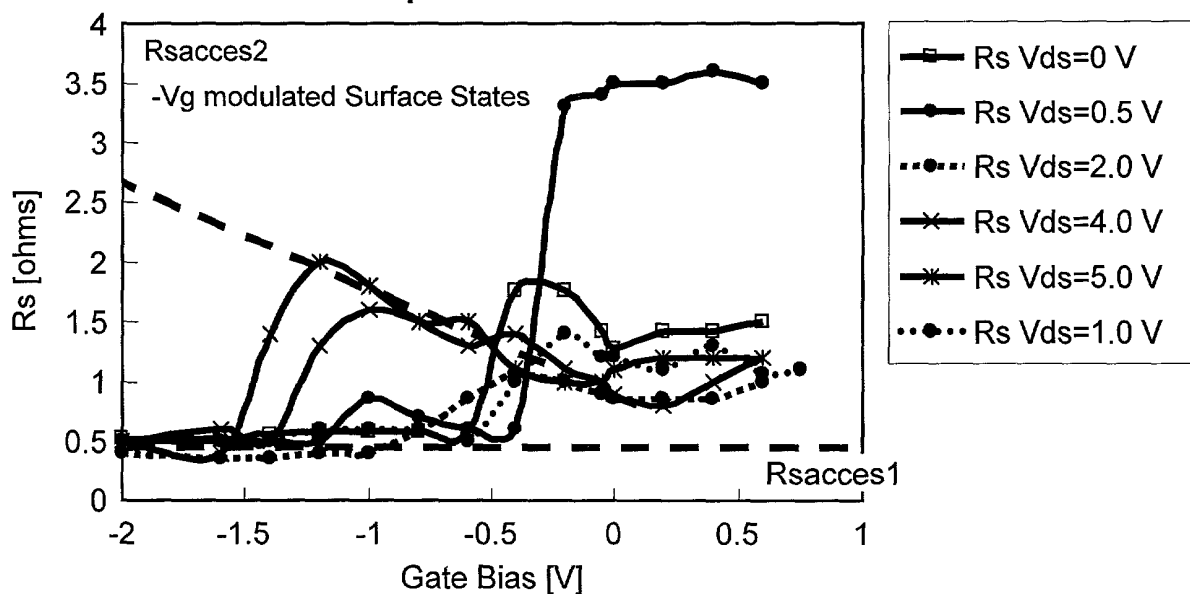


Figure 22

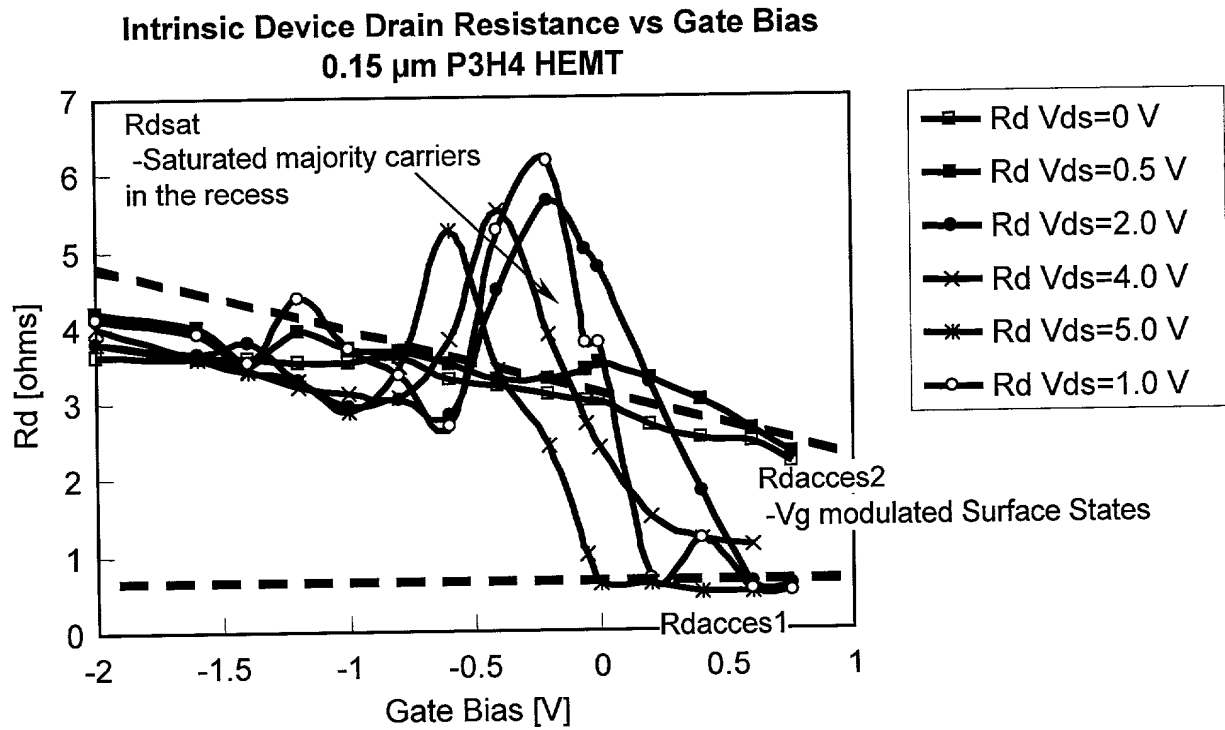


Figure 23

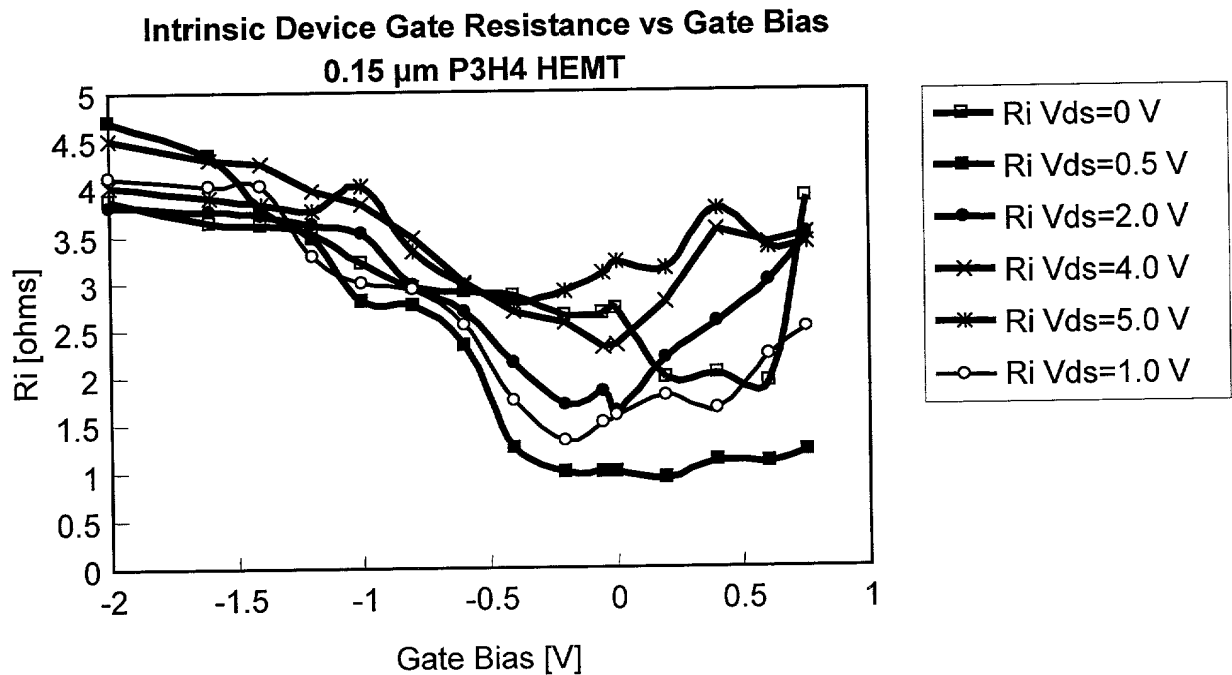


Figure 24

Intrinsic Device Line Capacitance vs Gate Bias **0.15 μ m P3H4 HEMT**

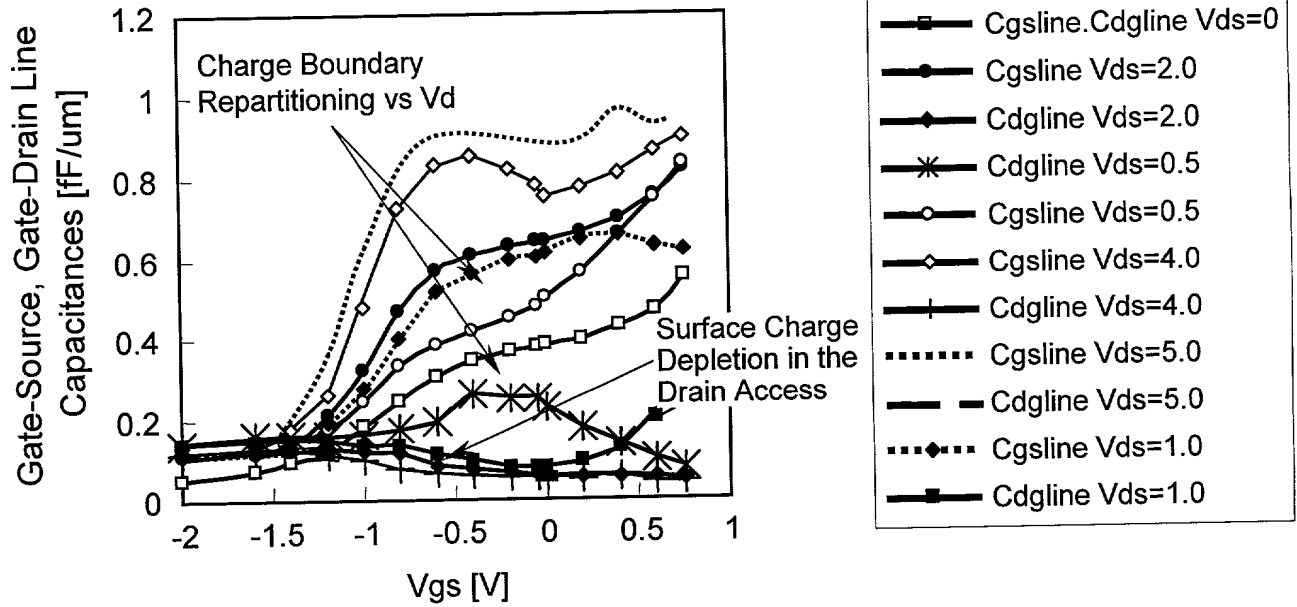


Figure 25

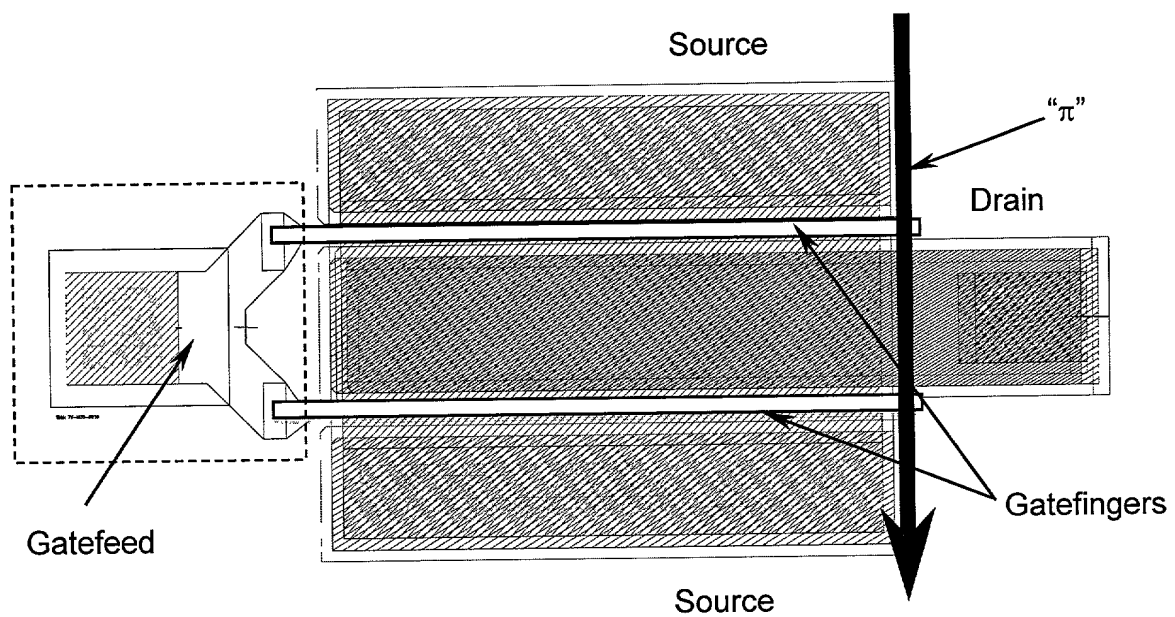


Figure 26

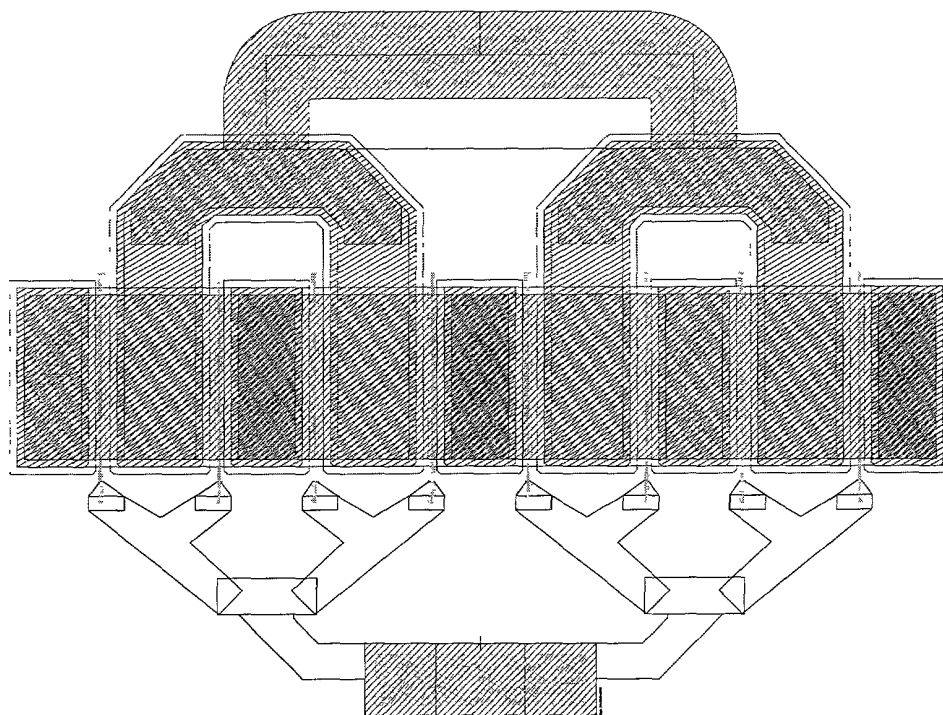


Figure 27

Model Construction

- 1) Off-Mesa, or Boundary Parasitic Model
- 2) Inter-electrode Parasitic Model
- 3) On-Mesa Parasitic Model
- 4) Intrinsic Model

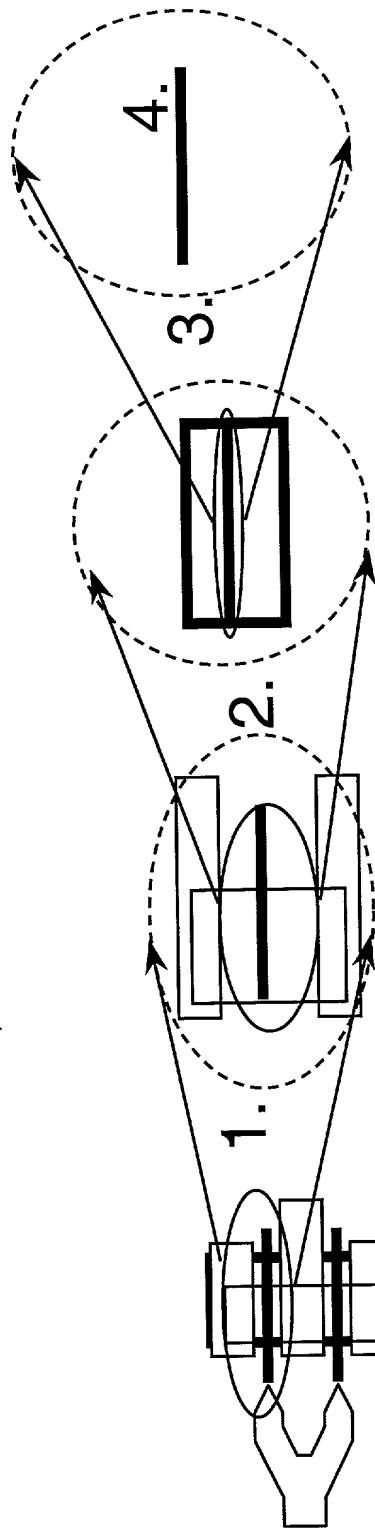


Figure 28

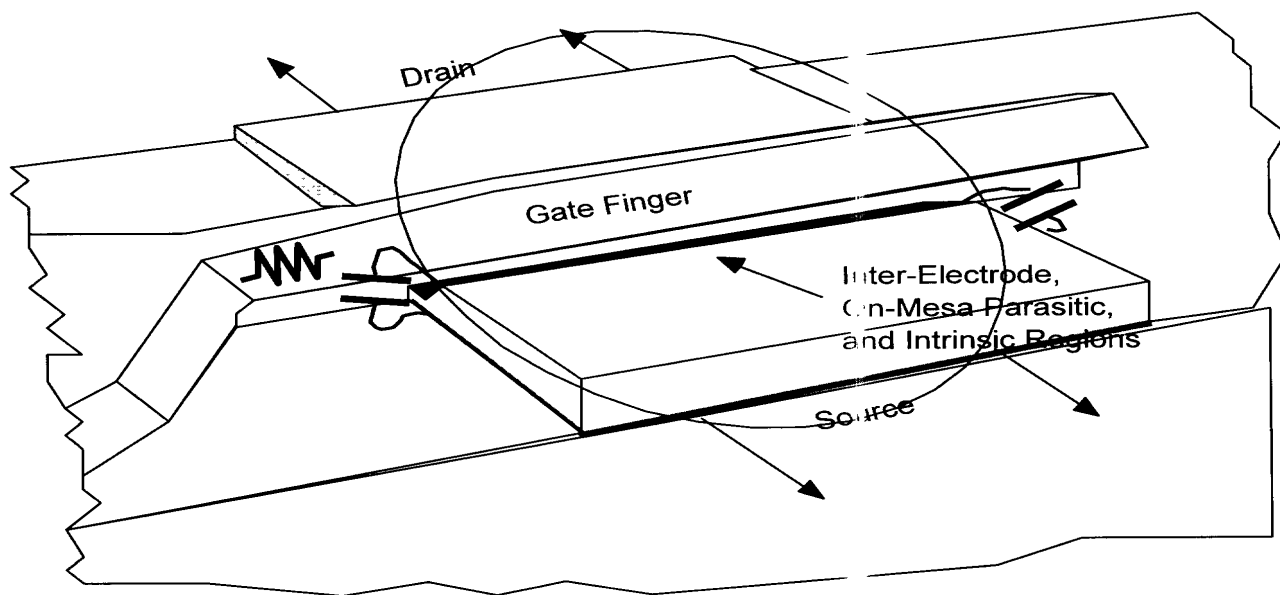


Figure 29

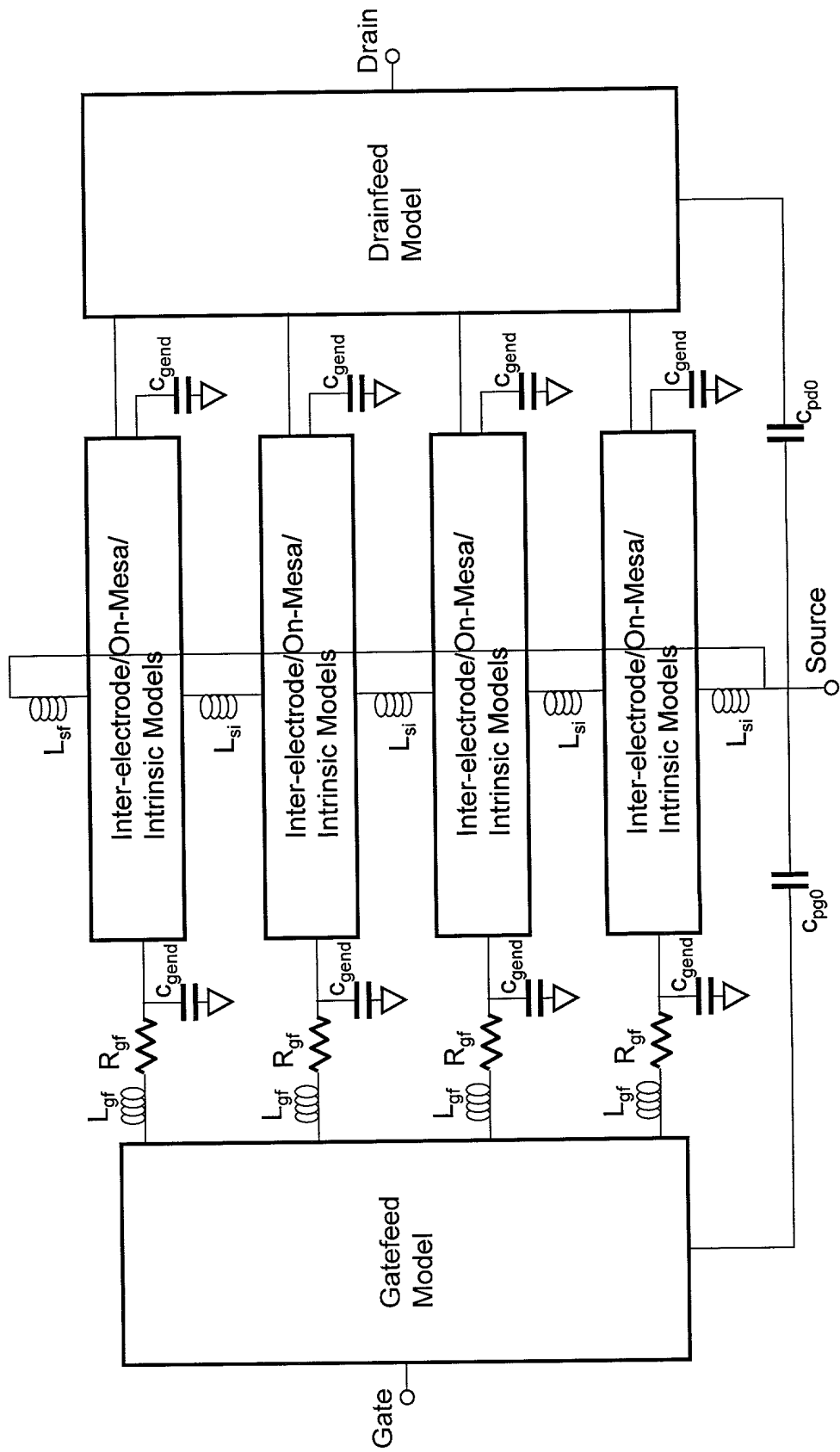


Figure 30

Figure 31

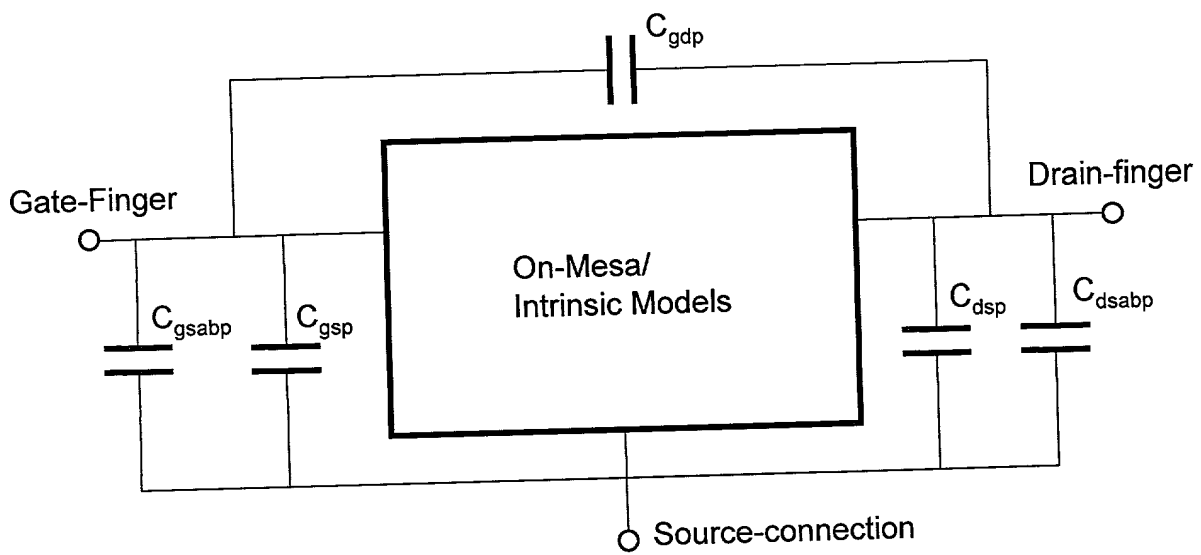


Figure 32

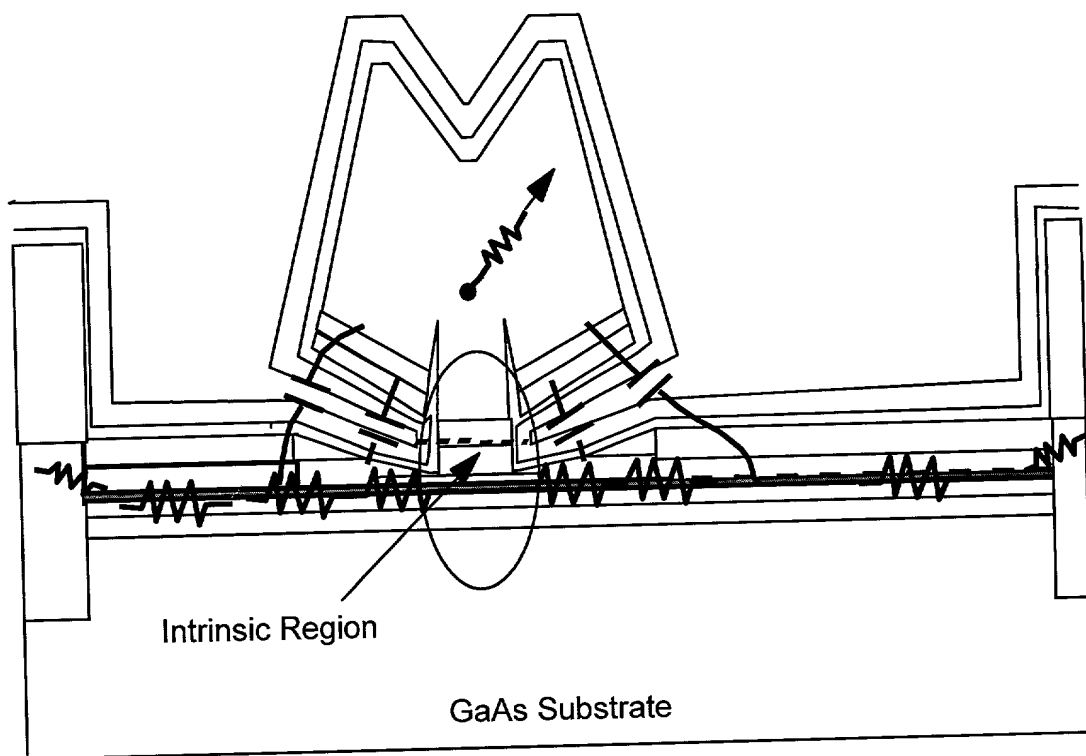


Figure 33

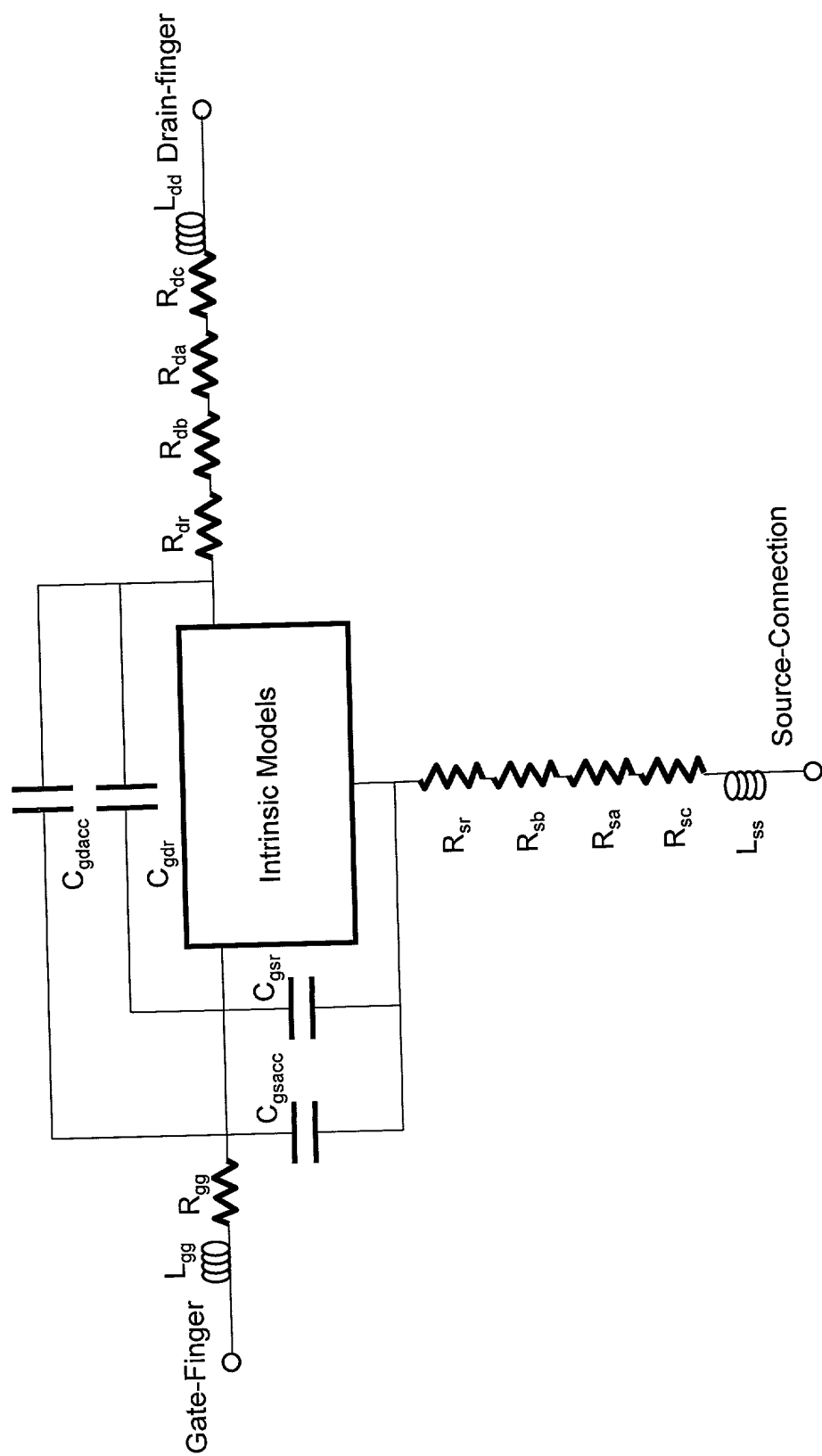


Figure 34

TECHNICAL DRAWING

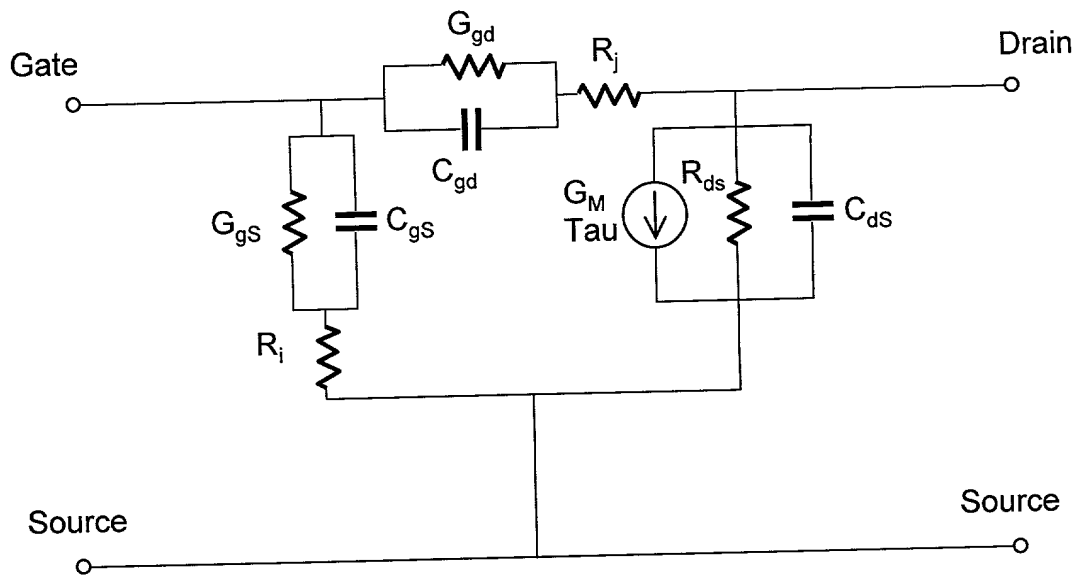


Figure 36

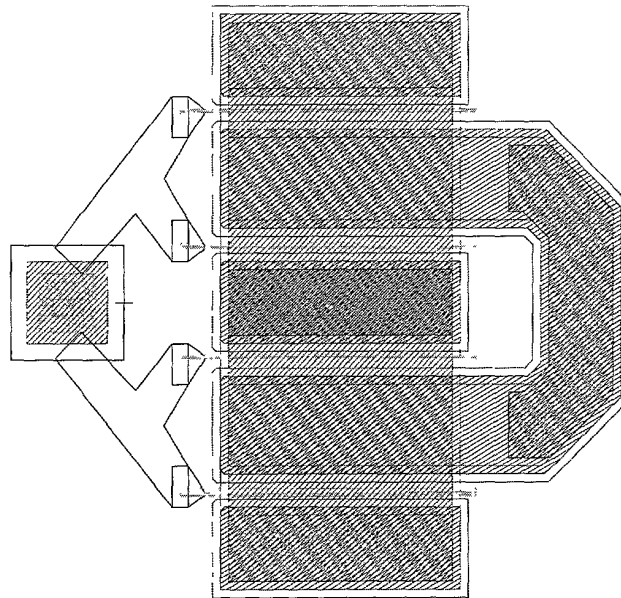


Figure 37A

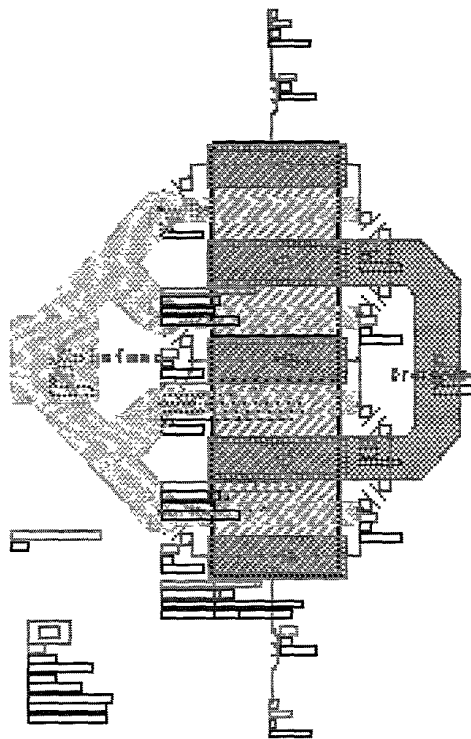


Figure 37B

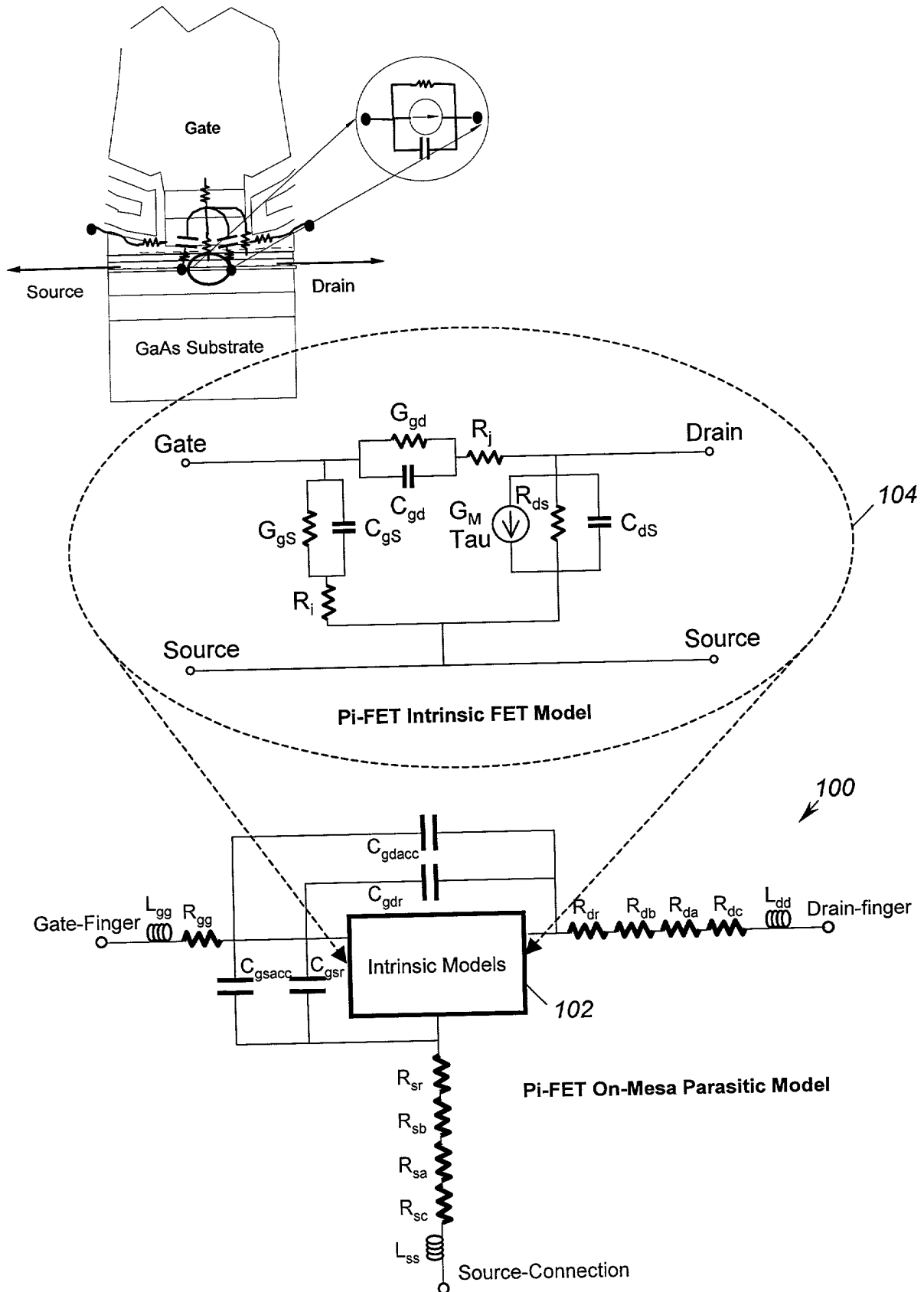


Figure 38

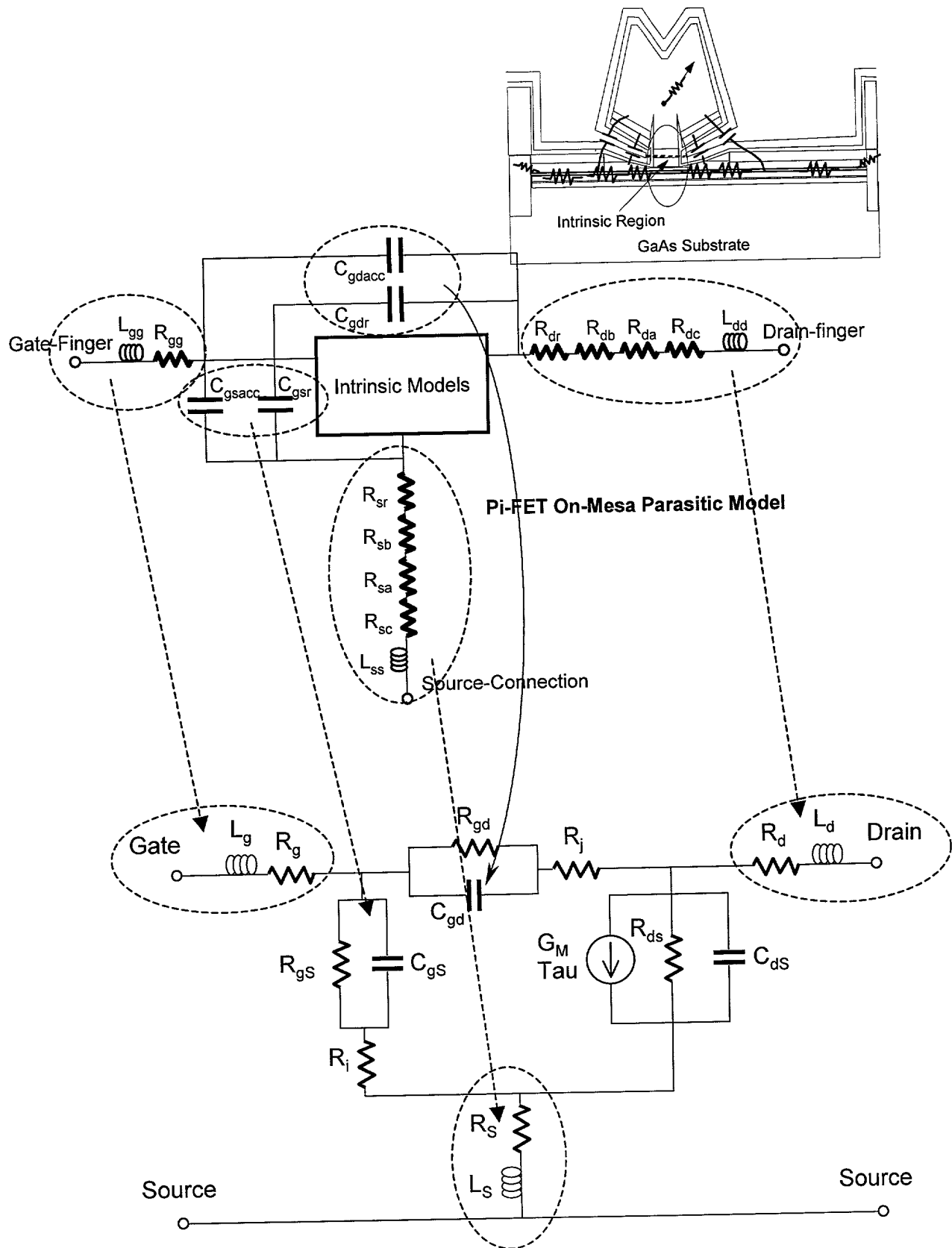


Figure 39

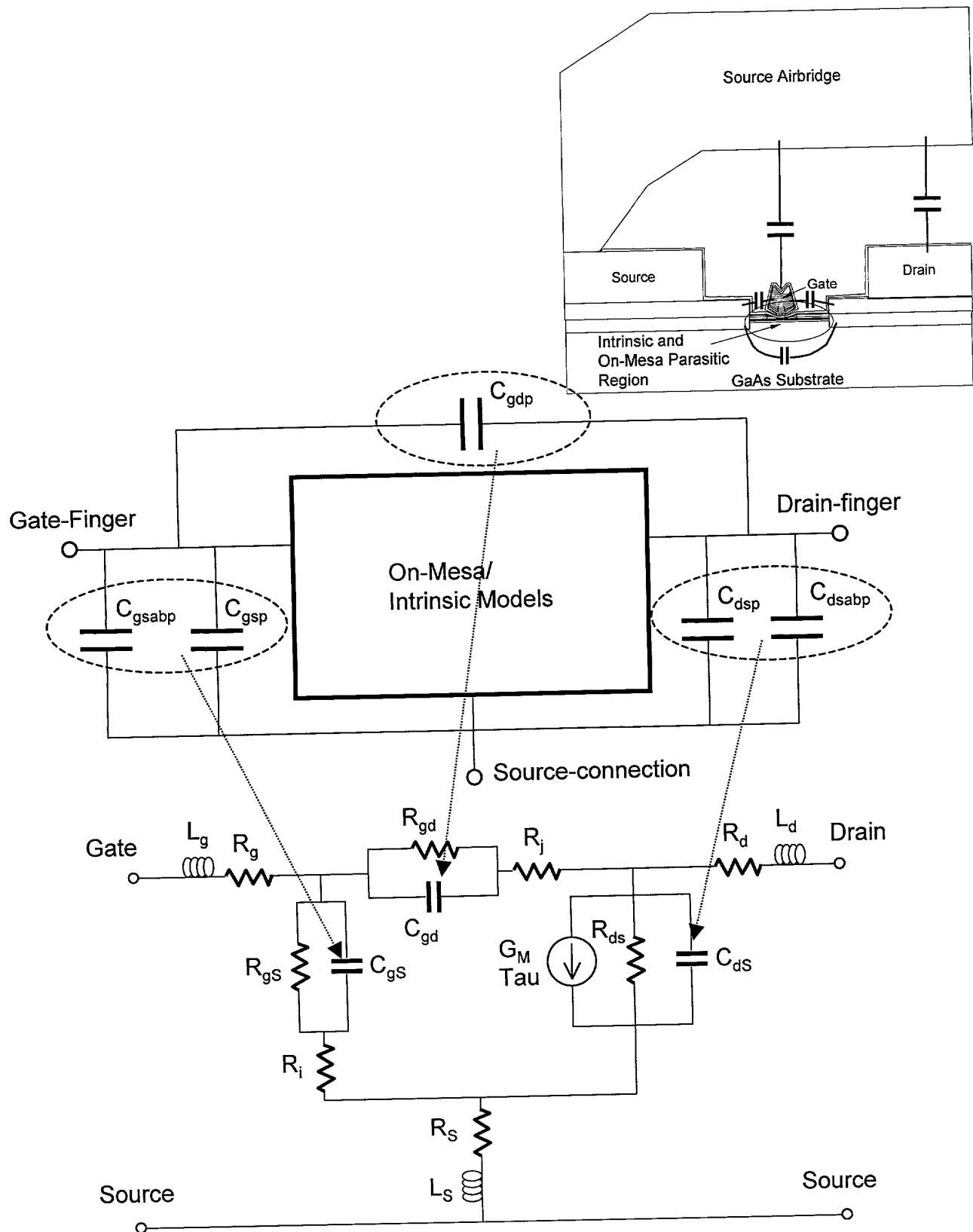


Figure 40

TOP SECRET 00507350

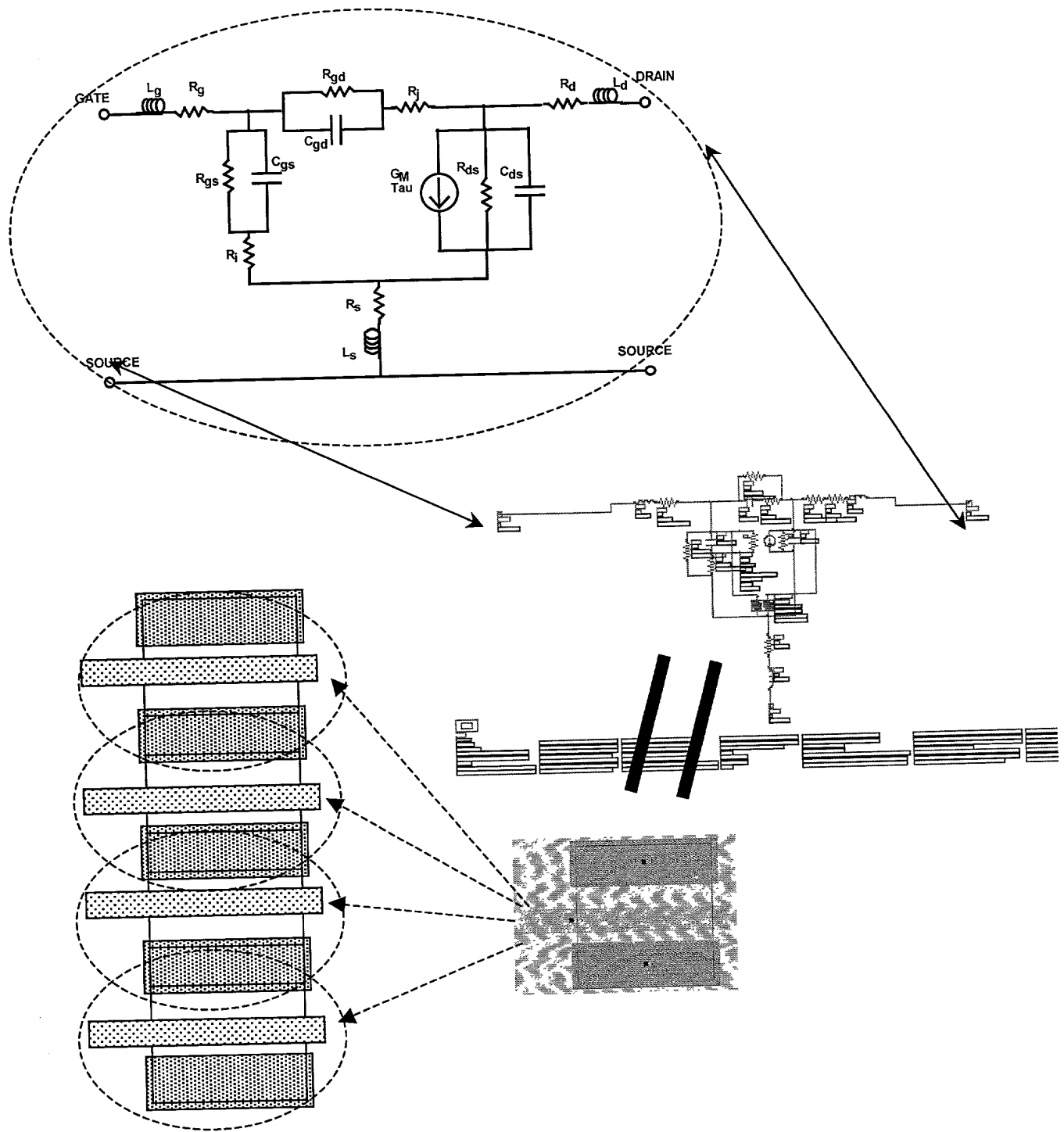


Figure 41

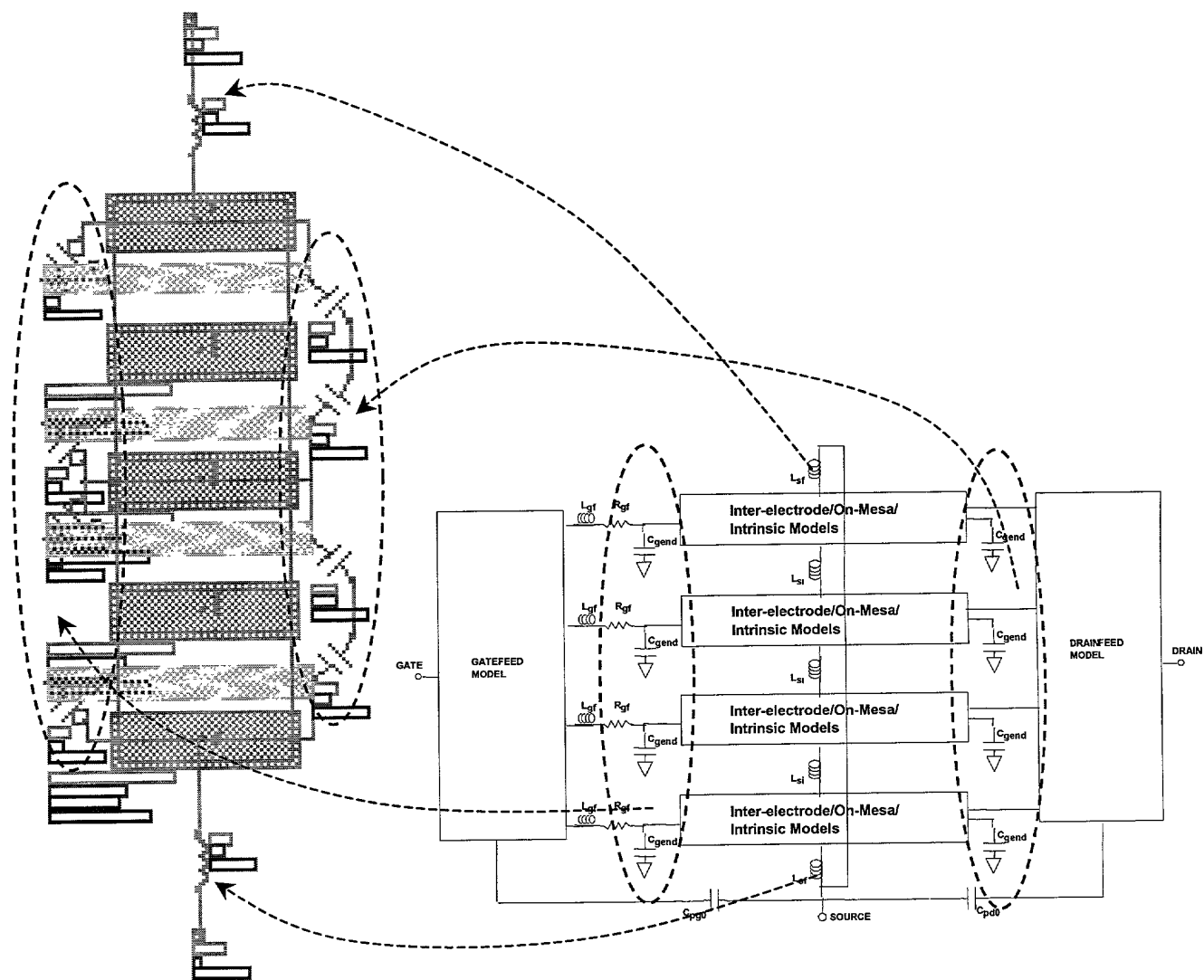


Figure 42

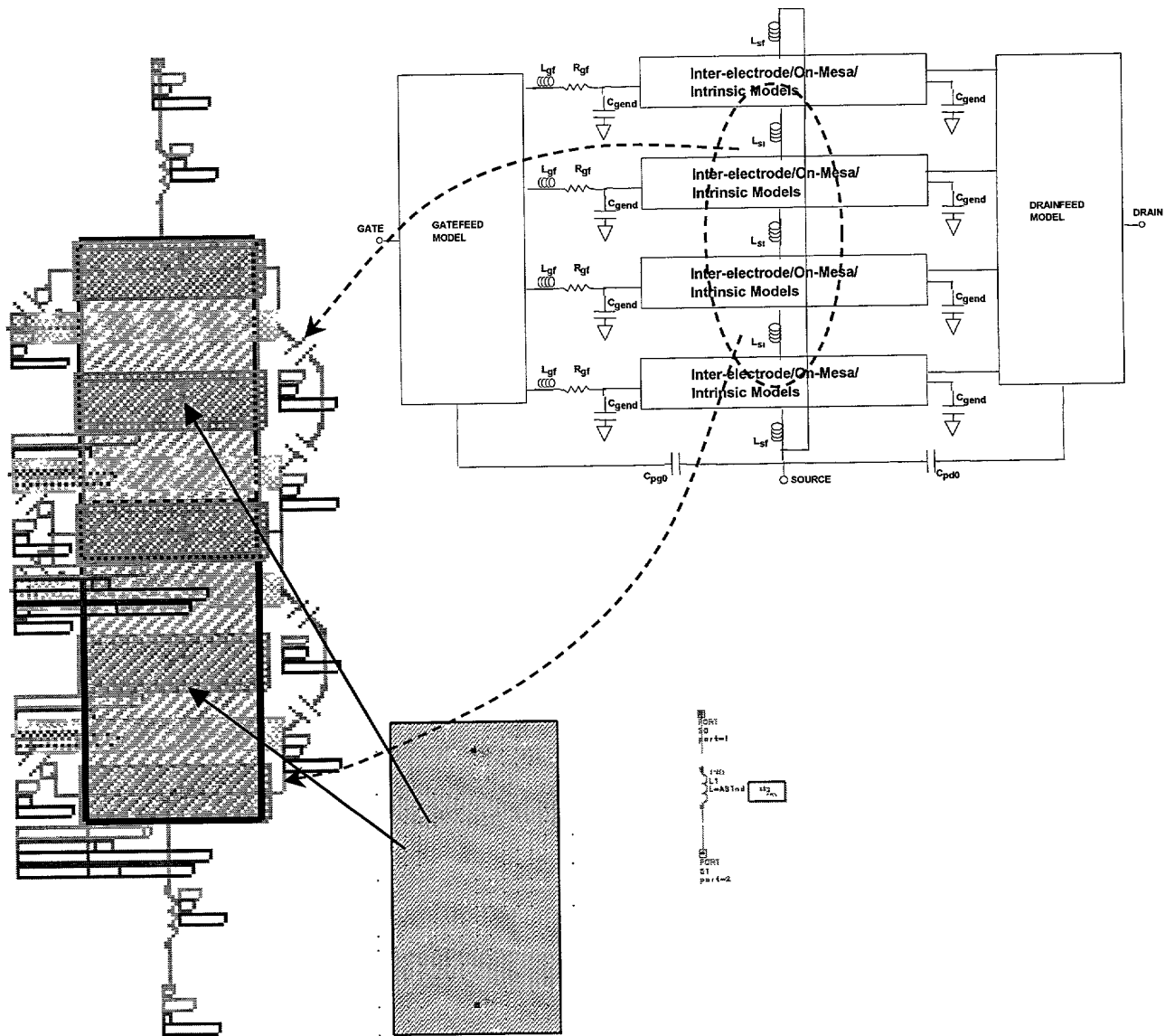
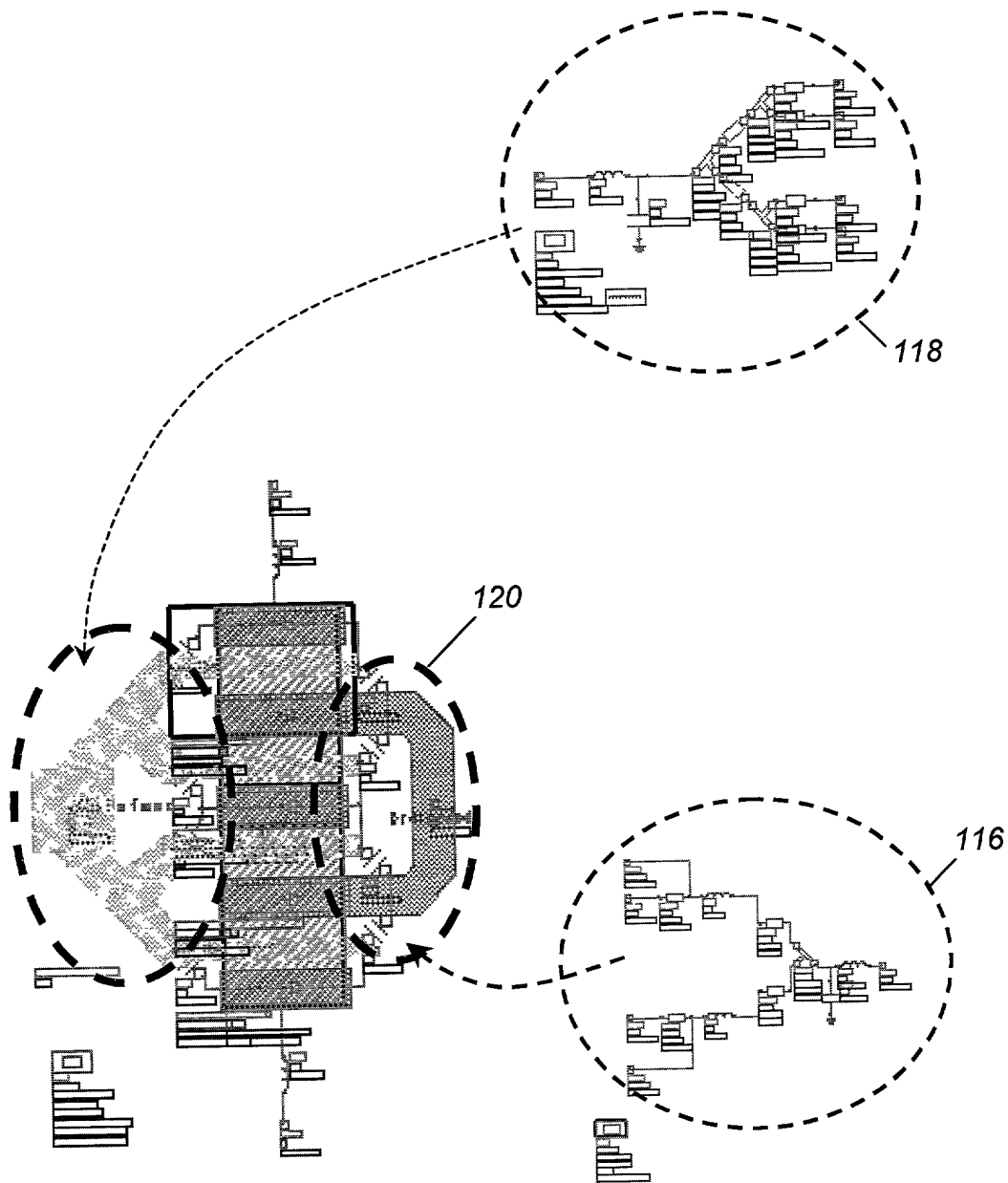


Figure 43



Implementation of the fifth level of embedding

Figure 44

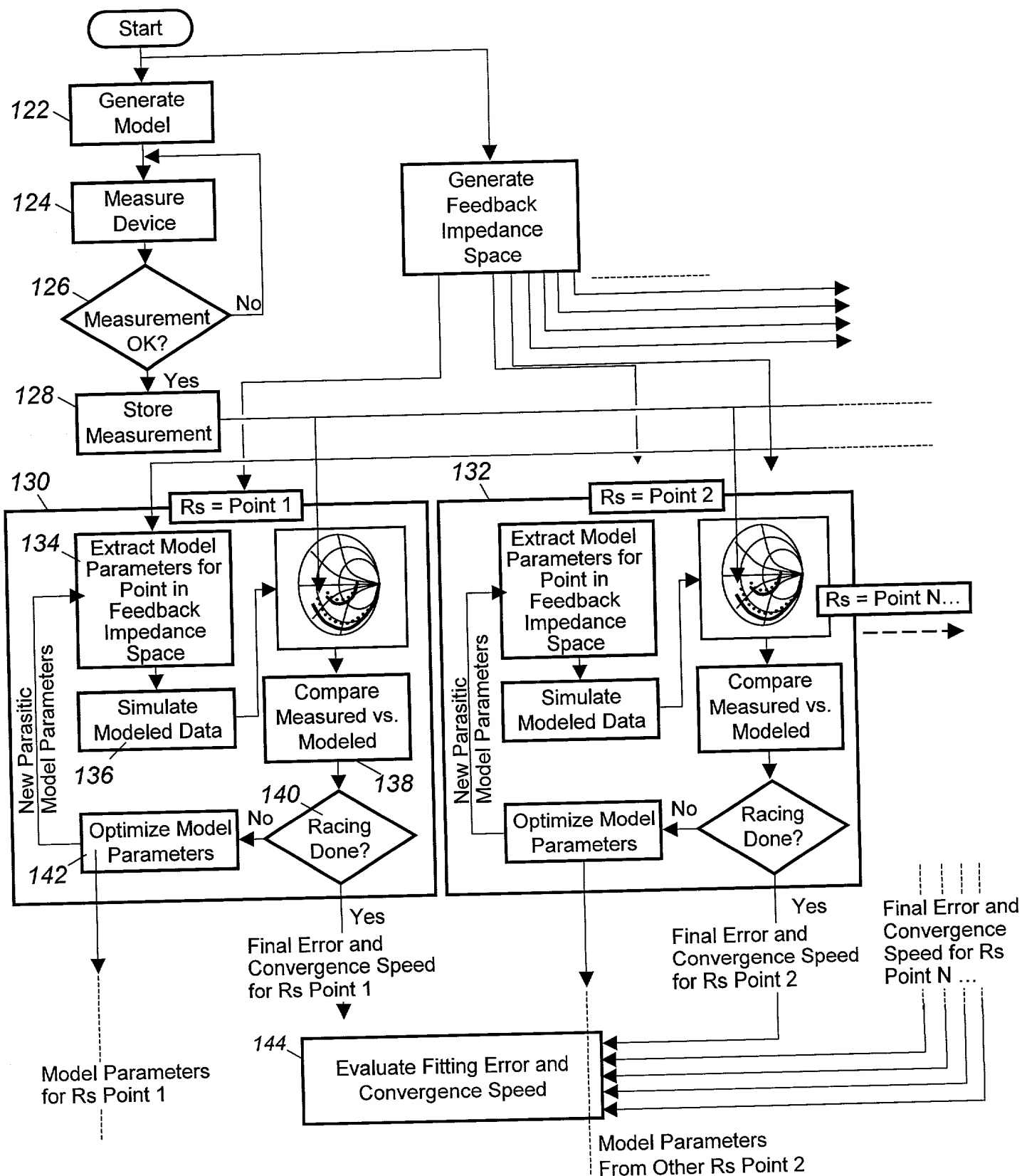


Figure 45A

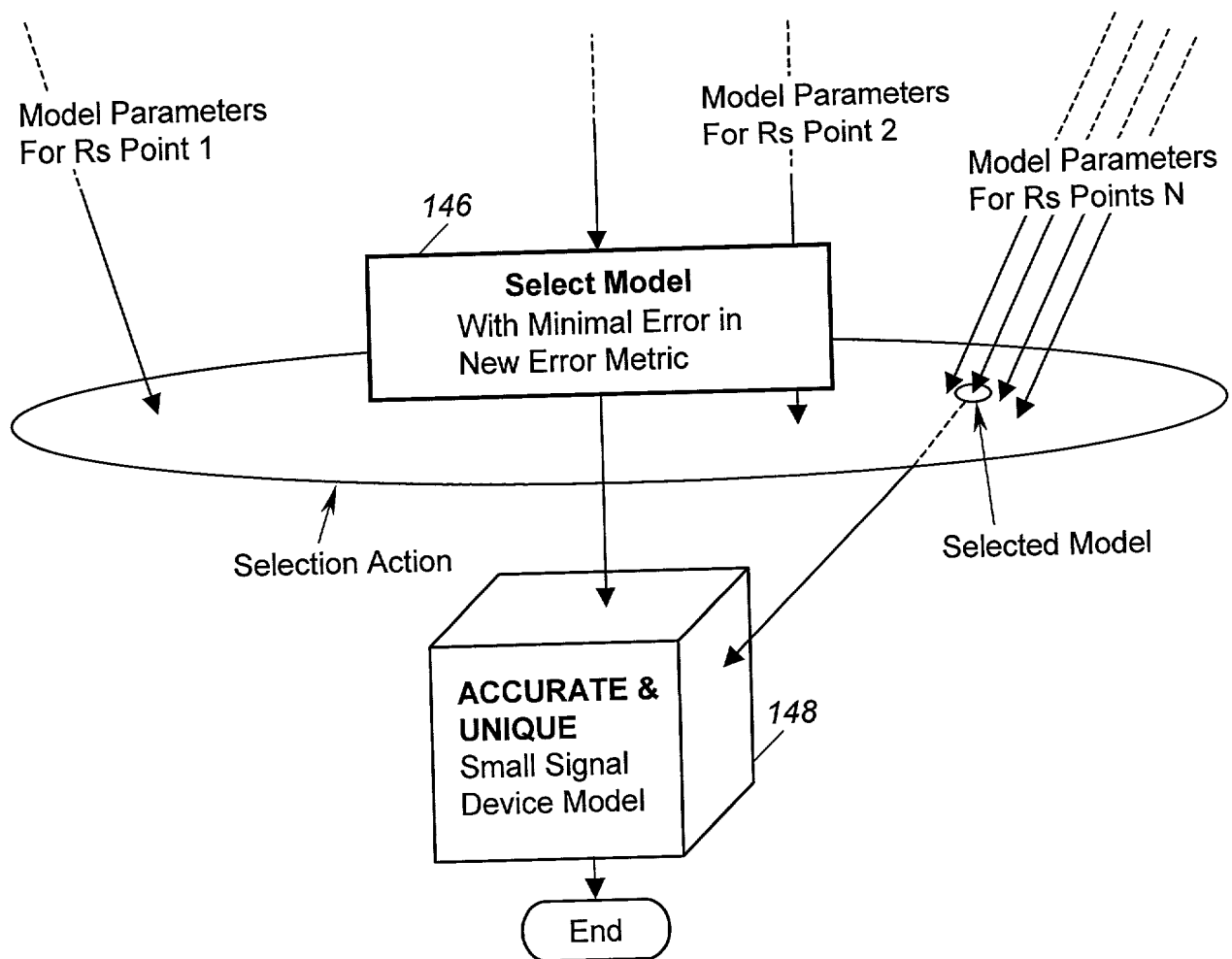
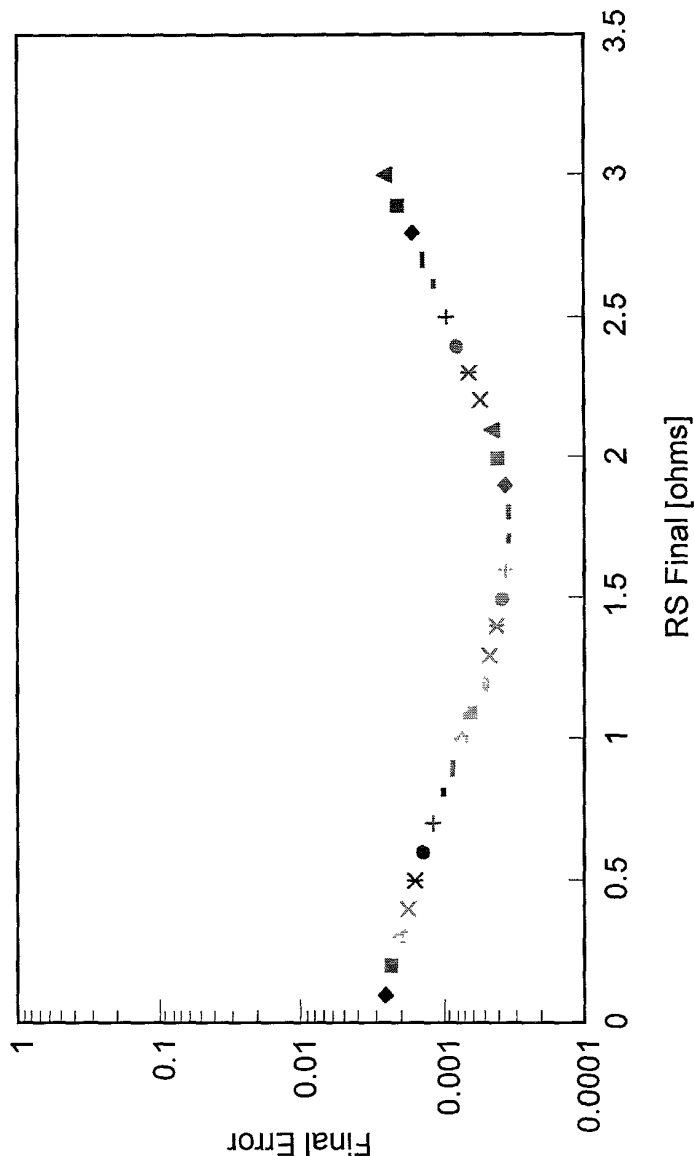


Figure 45B

Final Error vs RS Map for YYY-STATE 1coc__



- ◆ RS=0.1,RD=0.000004, RG=3.631111
- RS=0.2,RD=0.00006, RG=3.700725
- ▲ RS=0.3,RD=0.000006, RG=3.827767
- × RS=0.4,RD=0.000077, RG=3.917606
- ✕ RS=0.5,RD=0.000002, RG=4.002959
- RS=0.6,RD=0.000063, RG=4.121072
- + RS=0.7,RD=0.000672, RG=4.225347
- RS=0.8,RD=0.000007, RG=4.32573
- ▬ RS=0.9,RD=0.000001, RG=4.427338
- ◆ RS=1,RD=0.000284, RG=4.536612
- ▲ RS=1.1,RD=0.000042, RG=4.627873
- × RS=1.2,RD=0.380034, RG=4.667158
- ✕ RS=1.3,RD=0.861394, RG=4.69531
- RS=1.4,RD=1.568092, RG=4.676249
- + RS=1.5,RD=2.072742, RG=4.704008
- RS=1.6,RD=2.741666, RG=4.685351
- ▬ RS=1.7,RD=3.309899, RG=4.711895
- ◆ RS=1.8,RD=3.901662, RG=4.722658
- RS=1.9,RD=4.528121, RG=4.730933
- ▲ RS=2,RD=5.080991, RG=4.75499
- × RS=2.1,RD=5.649669, RG=4.781182
- ✕ RS=2.2,RD=6.197713, RG=4.81535
- RS=2.3,RD=6.720198, RG=4.855583
- + RS=2.4,RD=7.205221, RG=4.909625
- RS=2.5,RD=7.705211, RG=5.01476
- ▬ RS=2.6,RD=8.202621, RG=5.01476
- ◆ RS=2.7,RD=8.779481, RG=5.030824
- RS=2.8,RD=9.386087, RG=5.027081
- ▲ RS=2.9,RD=9.911043, RG=5.074825
- × RS=3,RD=10.48296, RG=5.083981
- ✕ RS=0.911268, RD=3.009443, RG=4.152256
- × RS=1.439659, RD=3.33544, RG=3.769519
- × RS=1.606168, RD=3.520349, RG=3.502953

Figure 46

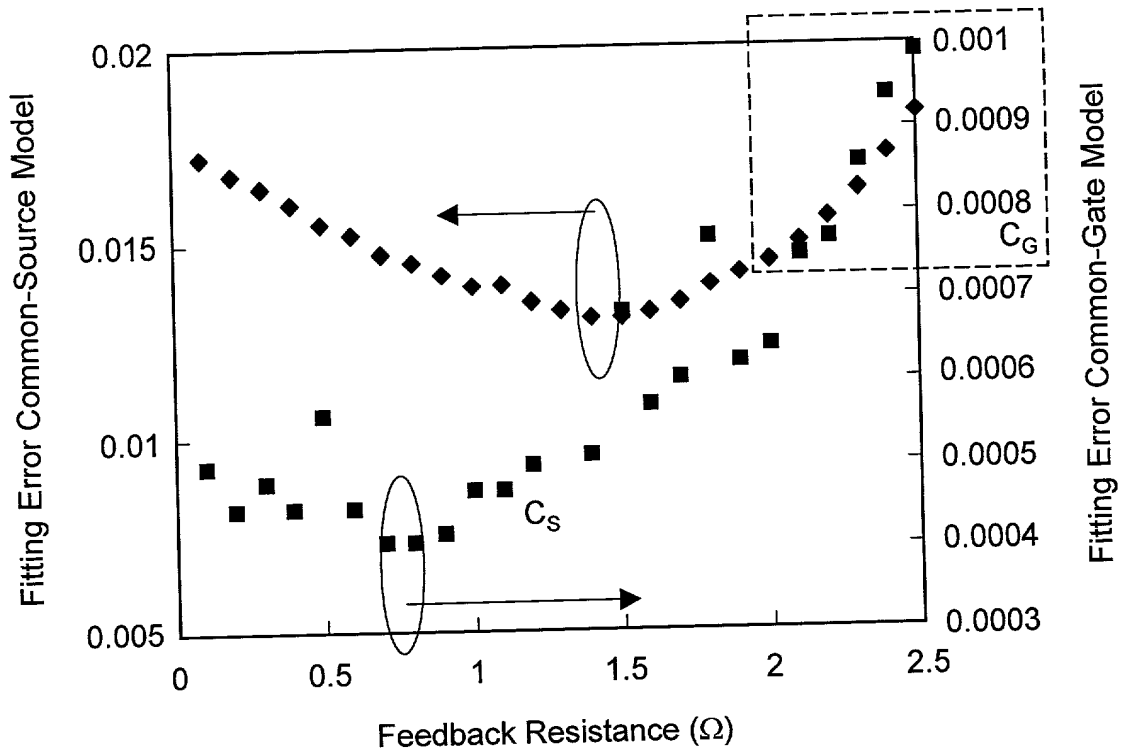
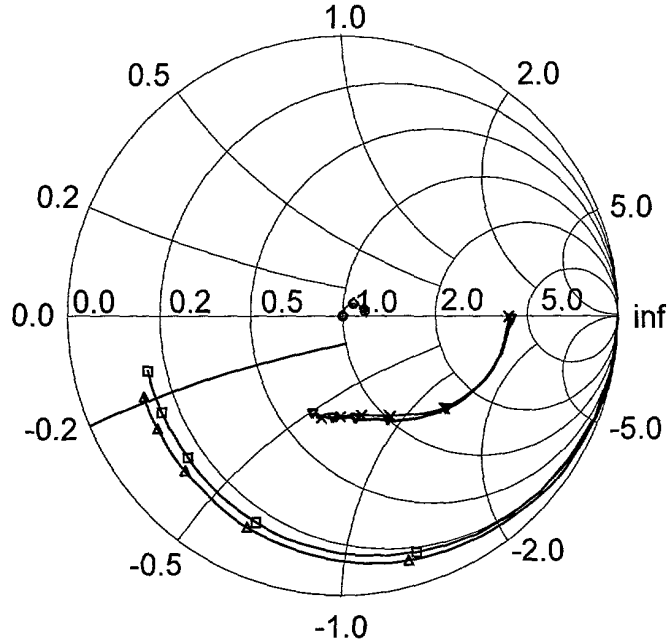


Figure 47

□ measure	○ measure	▽ measure	△ Simulated	◇ Simulated	× Simulated
SMAT1	SMAT1	SMAT1	SMAT1	SMAT1	SMAT1
S[1,1]	S[1,2]	S[2,2]	S[1,1]	S[1,2]	S[2,2]



Frequency 0.05 to 40.05 GHz

Figure 48A

□ measure	○ Simulated	▽ measure	△ Simulated
SMAT1	SMAT1	SMAT1	SMAT1
S[2,1]	S[2,1]	S[2,1]	S[2,1]
dB	db	Ang	Ang
		deg	deg

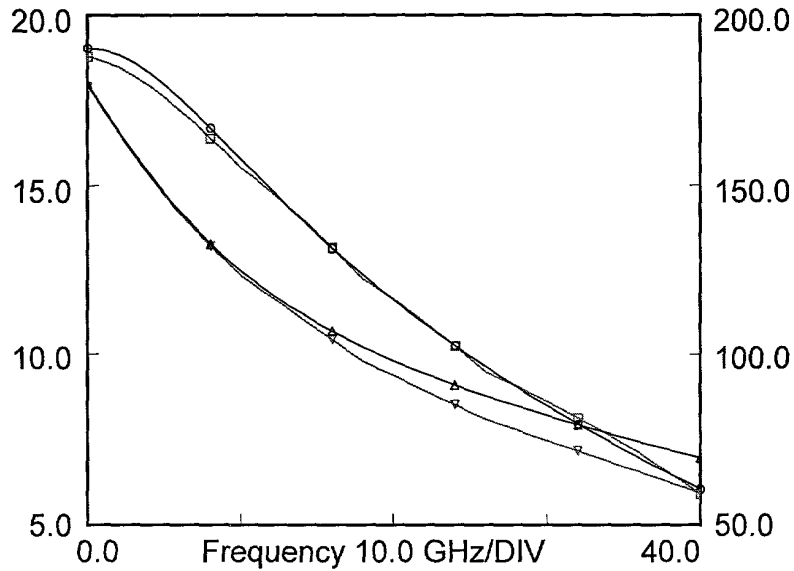
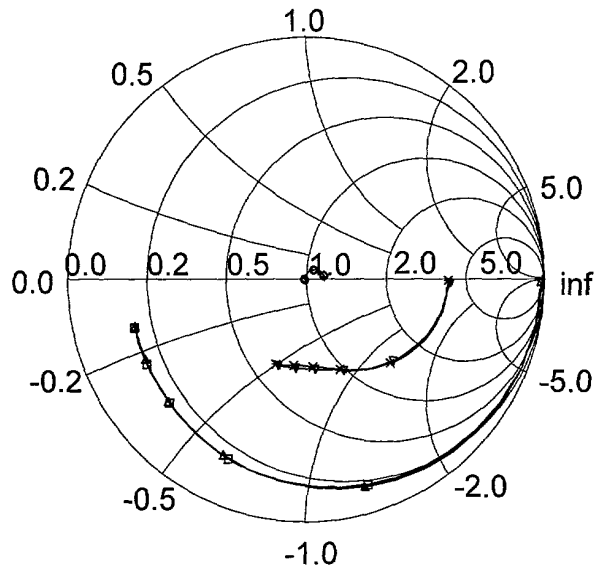


Figure 48B

□ measure SMAT1 S[1,1] ○ measure SMAT1 S[1,2] ▽ measure SMAT1 S[2,2] △ Simulated SMAT1 S[1,1] ◇ Simulated SMAT1 S[1,2] × Simulated SMAT1 S[2,2]



Frequency 0.05 to 40.05 GHz

Figure 49A

□ measure SMAT1 S[2,1] dB ○ Simulated SMAT1 S[2,1] db ▽ measure SMAT1 S[2,1] Ang deg △ Simulated SMAT1 S[2,1] Ang deg

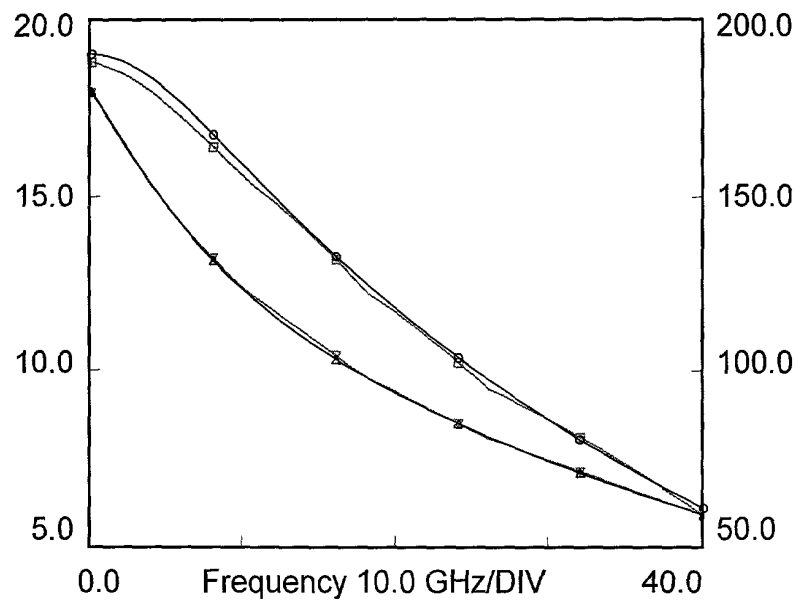
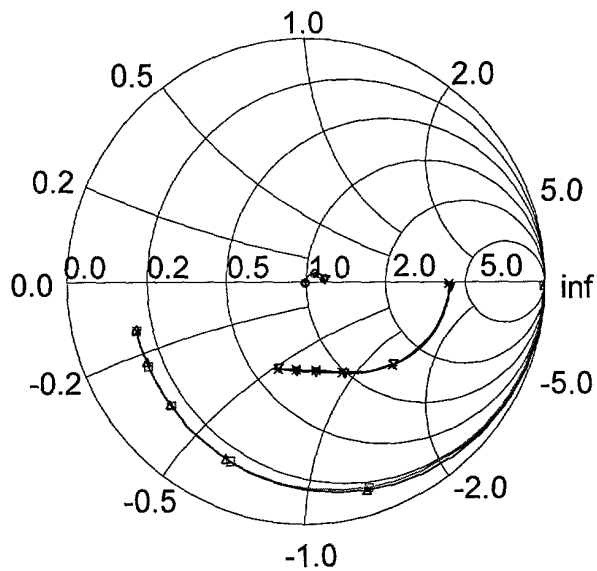


Figure 49B

□ measure SMAT1 S[1,1] ○ measure SMAT1 S[1,2] ▽ measure SMAT1 S[2,2] △ Simulated SMAT1 S[1,1] ◇ Simulated SMAT1 S[1,2] × Simulated SMAT1 S[2,2]



Frequency 0.05 to 40.05 GHz

Figure 50A

□ measure SMAT1 S[2,1] dB ○ Simulated SMAT1 S[2,1] db ▽ measure SMAT1 S[2,1] Ang deg △ Simulated SMAT1 S[2,1] Ang deg

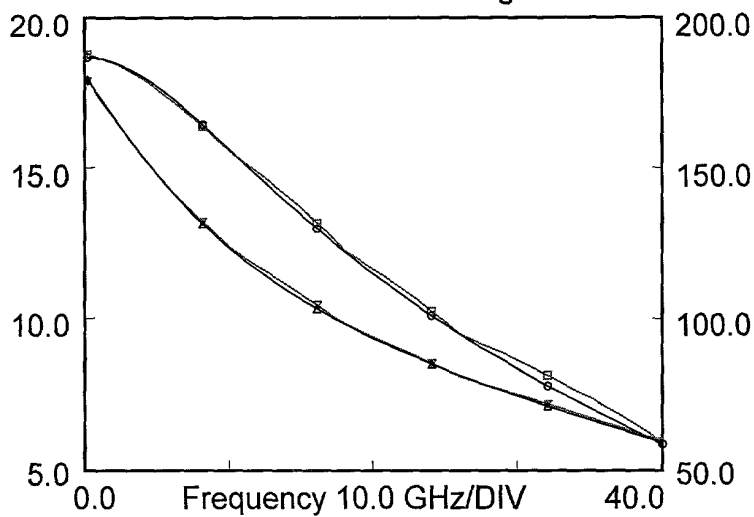


Figure 50B